COAL AGE

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Perpetuating the Thrift Habit

BY FLOYD W. PARSONS

IT IS probably true that of all the serious problems confronting the American people today none is of greater moment than the question of how to encourage and continue the saving habit that has been developed in the United States during the war. The mine manager who believes that the matter of individual thrift on the part of his employees is no concern of his is perpetrating a serious folly.

One investigator found that in two great corporations the labor turnover amounted to 187 per cent., which when analyzed developed the significant fact that of this amount the proportion of married home owners was but 4 per cent., and that of married renters only 11 per cent. Nothing could prove more conclusively the benefits that accrue to a company from the development of thrift among its employees. It is unnecessary to stop to prove that permanency and stability on the part of employees breed efficiency and create profits.

When this country entered the war, we had in the United States only 300,000 investors. It is estimated that today 25,000,000 Americans are bondholders. This means that practically every family in the country, mostly through patriotic motives, has practiced thrift. Shall we view this change in habit with indifference and permit the Nation to slide back into the uneconomical customs that prevailed before the war? Or, shall we profit by the lesson we have learned and build in every community still greater organizations designed to perpetuate habits of economy?

Throughout the world, restless dissatisfied people under the guise of Bolshevism, or some other "ism," are holding forth destructive ideas which they submit as a panacea for all political and social ills. Such campaigns fall flat when an effort is made to proselyte a community of property owners. The man who owns his home and who has invested his earnings in the bonds of his government, and in the stock of the company he serves, is not easily converted to a faith that teaches turmoil and destruction.

An extension among coal miners of the habit of saving would undoubtedly improve their living conditions; but it would do more, for such thrift would not only benefit the fuel industries but it would increase the volume of capital, thereby stabilizing the Nation's financial and political habits. It is for this reason that the great business leaders of the country are urging that employers should use such methods of distributing the forthcoming bonds of the Fifth Liberty Loan as can be continued permanently thereafter. In this way the thrift momentum will not be lost, and the habit of saving in America will be placed on an established basis.

The United States is splendidly equipped to maintain its present position as the most powerful nation on earth. Great Britain and Germany each has contracted an indebtedness of $40,000,000,000; France owes $30,000,000,000, while the indebtedness of the United States is only $21,000,000,000. Our position has changed from that of a borrowing country to that of an investing country—like England and France were before the war. Our people must be taught to understand the necessity of investing abroad, and that by so doing they protect themselves.

High wages can only be maintained by the workers putting back their earnings into money-making enterprises. Saving must be made as attractive and as easy as spending. Heretofore it has been a difficult and gloomy practice. We must put joy into it. It will be necessary also to introduce the business of saving to every individual. Last year the working people in this country bought $3,000,000,000 of Government securities, or nearly as much as the total average savings placed annually in all the savings banks in America. And this $3,000,000,000 was on top of the usual savings placed in those banks.

Right now is the opportune moment for each and every coal company to perform a real national service in fostering the habit of thrift among the miners of America. Incidentally, such action would be a marvelous stroke of good business.

IDEAS AND SUGGESTIONS

Attachment and Care of Lubricators to Insure Efficient Engine Operation

BY JACK L. BALL
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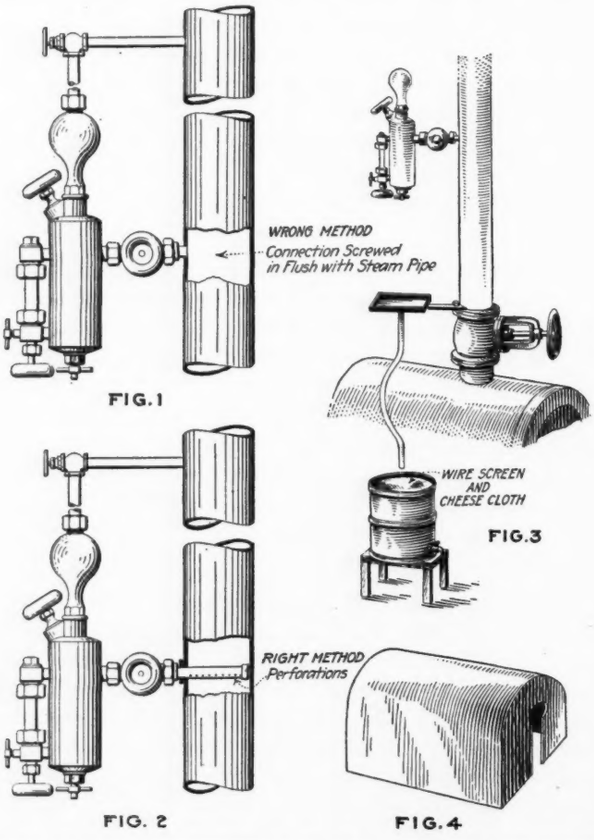
For the smooth and economical operation of a steam engine or pump, a lubricator of some kind is needed to feed the oil in such manner that the cylinder walls and valves may be lubricated. As the sight feed or hydrostatic lubricator is the one most commonly used around the mines, I shall confine my notes to this type exclusively.

When connecting a hydrostatic lubricator to the steam line, the idea is, or should be, to so make the connection



FIGS. 1 TO 4. SUGGESTIONS FOR ATTACHMENT AND CARE OF LUBRICATORS

that the oil will mingle freely with the steam, insuring complete atomization and causing a better distribution of the oil to the valves and walls of the cylinder.

Fig. 1 shows a fault commonly met with. The connection is screwed in flush with the inside of the steam line, allowing the oil to run down and adhere to the side of the pipe. This method is wrong and uneconomical. The connection shown in Fig. 2 has been proved by experiment to be a much better method of attachment. It will be readily seen that with the latter connection the oil has a chance to mingle freely with the steam and is more completely atomized.

Lubricators should be cleaned quite often. This is easily done by blowing out with steam. A common difficulty encountered is that of the sight feed glass becoming dirty. This is caused by the oil not feeding in drops, but running out and sticking to the side of the glass, or arises from the drops being too large. If the drops are too large the permanent remedy is to make the feed nozzle smaller. If the oil feeds in a stream or the drops are too large, a temporary cure is to put a small piece of soap inside the sight feed glass.

It sometimes happens that a lubricator is in a place where it is exposed to cold. This, of course, congeals the oil so that it will not feed properly. A common way to remedy this is to wrap a piece of brattice or other cloth around the lubricator and the steam line. This will then keep the lubricator warm.

It is a common practice among engineers, firemen and pumpers when filling a lubricator to use a pair of combination pliers or a 10-in. pipe wrench to open or close the drain and filling plugs. This is wrong. These plugs are so made that they can be closed with a slight pressure of the fingers and be perfectly tight. They will remain so for years if this precaution is taken.

Probably few power-house men have taken the time or trouble to save the oil that is wasted from lubricators. This may be but a few drops a day or, again, it may be considerably more. At one mine where there are several lubricators used the device shown in Fig. 3 has been installed to save the waste oil. The engineers were much surprised to learn that enough cylinder oil was being wasted to lubricate, after proper filtration, a large steam-driven pump in the mine. Fig. 4 is a piece of roofing iron so formed that it will set in the tray shown in Fig. 3 and keep the lubricator warm in cold weather

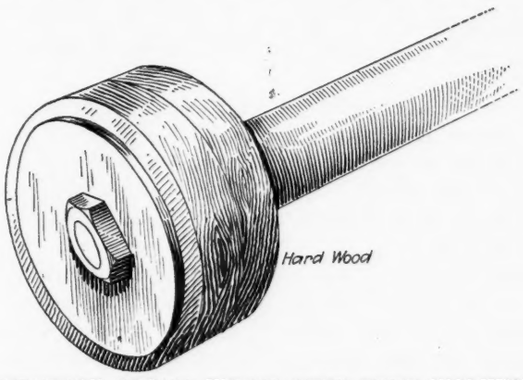
Novel Emergency Pump Repair Saved Both Time and Money

In coal mining, as in other phases of mineral production, output is an important factor in economical operation. When the output decreases the costs usually increase. Consequently, no reasonable diligence is spared in order to keep the mine product moving steadily. To accomplish this many expedients and makeshifts, usually of a temporary nature, are resorted to. Thus in one sense the most successful mine mechanic is the man who with small resources can temporarily accomplish the biggest results.

The accompanying illustration shows an emergency pump repair, or one that can be used in case of necessity. Should no packing be available for the regular pump piston, or should the piston head be broken, two or more pieces of hardwood plank may be drilled to fit

the bore of the piston rod and turned up around the circumference to fit the bore of the pump barrel. This fit should be a loose one, since all wood swells somewhat when it absorbs water.

To replace a regular pump piston head with two thin

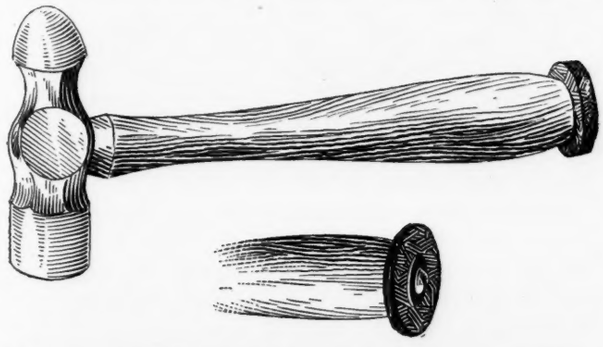


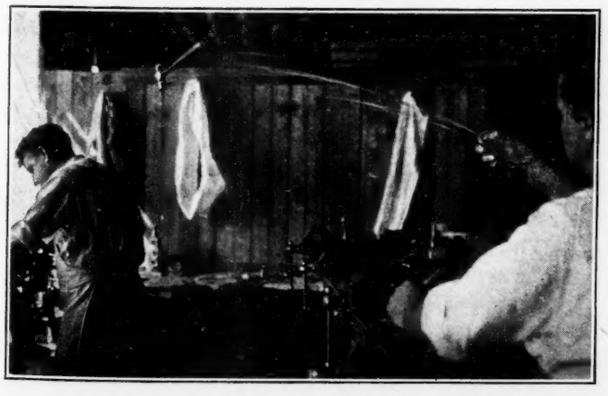
EMERGENCY REPAIR WHICH KEPT PUMP WORKING

follower plates and two circular pieces of plank can by no stretch of the imagination be considered as being a workmanlike job. In times of necessity, however, such makeshifts are entirely justifiable.

Preventing the Hammer from Slipping

Often a hammer will slip out of the hand of a workman who is engaged in repairing greasy machine parts. The accompanying photograph shows an accident of this kind, in which the flying hammer struck a coworkman,





HAMMER SLIPPED AND INJURED WORKMAN—THE GUARD SHOWN PREVENTS TOOL FROM SLIPPING

injuring him seriously. To prevent accidents of this character, hammers that are used when repairing oily machine parts should be provided with a leather washer fastened to the hammer handle as shown in the drawing.

Generator Cable Resistance That Will Last Long Time If Properly Installed

BY J. J. NOLAN
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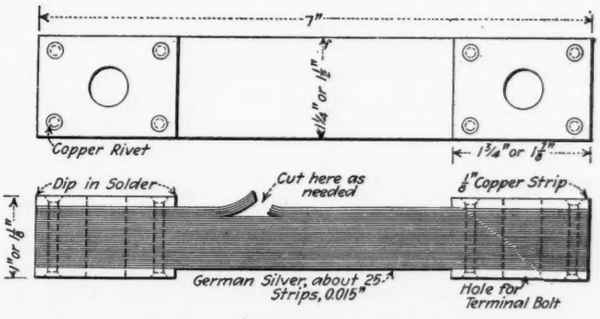
The accompanying illustration shows resistance that has been in use in two separate power plants where two or more direct-current generators are operated in parallel. Quite often little attention is paid to the load when it is not equalized between two or more generators working in parallel, and it is a common occurrence to see one generator taking more than its share of the load unless the attendant keeps moving the rheostat throughout the day. Around coal-mining plants the load is highly variable and when switches are pulled after closing down at the end of the day's run a difference of 10 to 25 volts might be found on the voltmeters of different generators.

On looking closely several pounds of german silver might possibly be found connected across the extreme ends of the series field of the generator that is inclined to take more than its share of the load. This is an old practice, but seldom has it been found to do any good. The cables leading from the machines to the board



RESISTANCE FOR GENERATOR CABLE

should be of the same cross-section and length if the generators are of the same capacity. If cables leading from one generator are longer than those from the other, a suitable resistance should be connected into one of the shorter cables. This resistance should be of suitable strength and of such nature that the rise in temperature necessarily resulting from its use will not carry into the terminals of the cable or to the stud where it is connecting and injure the connection, melt the solder or pit the joint, later offering too much resistance at times and perhaps causing an "open" in the line or a serious burnout on heavy load that would result in a shutdown.

The resistance here illustrated will last indefinitely if installed properly with a clean snug joint, bolted up firmly. The ammeters should be watched carefully when a fair load is on, and if the generator which formerly took the largest share of the load continues to do so, one or two strips should be cut and results noted. Also, the resistance piece should be felt during the load so as to determine if it is offering enough resistance; if not, more strips should be cut and bent back until the desired results are obtained.

The man who does not get a certain satisfaction out of his work is losing the best part of his pay.

Safety Gate Protection at Mine Shaft

By R. P. HINES
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SYNOPSIS — *A combination of devices is here described that will permit the shaft gates to be opened only when the proper cage is in place at the landing. The cage then can not be lowered until the shaft gate is again closed and locked. A few special pieces were required, but most of the material used was of standard design.*

IT IS the purpose of this article to describe the method used by a large operating company to obtain protection for the gate at the man, or surface, landing of one of its mining properties in the Pennsylvania bituminous district. In order, however, that the exact relation of the protective system and devices to the other parts of the equipment may be more fully understood, a general description of the hoisting system will first be necessary.

The mining plant includes a double-compartment shaft, the two compartments being of 6 ft. 10 in. by 11 ft., and 7 x 11 ft. on 7 ft. 4 in. centers. Through these the coal is hoisted from a depth of 345 ft. by an electrically driven hoist, also used for hoisting and lowering men.

The hoist is a double, conical, grooved-drum machine, each drum being 6 ft. 6 in. diameter at the small end and 8 ft. 6 in. in diameter at the large end, and of sufficient face to coil 500 ft. of 1¼-in. wire rope, allowing three extra turns for fastening. One of the drums is tight on the shaft, the other being loose and driven by a heavy toothed internal clutch wheel with machined teeth, for taking up slack and for the adjustment of the length of rope should it be desired at some future time to hoist coal from a lower level. Two band brakes are provided, these being of the weighted type, operated by air cylinders.

The hoist is operated with the cages and cars in balance, self-dumping cages being used. It is driven by a 250-hp. three-phase, 60-cycle, 450-r.p.m. synchronous-speed, 2200-volt, variable speed, slip-ring induction motor. This is attached to the pinion shaft by a flexible coupling, single reduction herringbone gearing being used.

A master-type drum controller is mounted on the hoist operator's platform, being used in connection with a 2200-volt, air-break, two-pole reversing contactor for reversing the direction of rotation of the hoist motor, and also a low-voltage contactor equipment for varying the speed of the motor, by varying the resistance in the rotor circuit.

A bank of three 85-kva., single-phase, 60-cycle, outdoor type, oil-insulated, self-cooled transformers are mounted on a steel framework outside the hoisthouse. These reduce the voltage from 11,000, at which the power is received from the transmission line, to 2200 volts, at which it is delivered to the hoist motor.

The electrical equipment furnished included the usual standard type of limit switches to be installed on the guides to prevent overtravel of the cage. There was also included a motor-driven air compressor to furnish compressed air for the operation of the brakes of the hoist.

There was later added to this equipment a device for the prevention of overwinding and overspeeding, including special man-landing protection. The electrical control devices are so arranged that when hoisting men it is impossible to run the hoist in excess of 900 ft. per minute, rope speed.

This device for the prevention of overwinding and overspeeding is of Vulcan Iron Works manufacture, and together with the scheme for automatically stopping the hoist at the man landing is protected by letters patent.

Fig. 1 accompanying this article gives a good idea of the device, as it shows it with the cover removed. A horizontal shaft, or spindle, bearing a square thread is carried in bearings at each end of the box-like supporting structure. One end of this spindle carries a

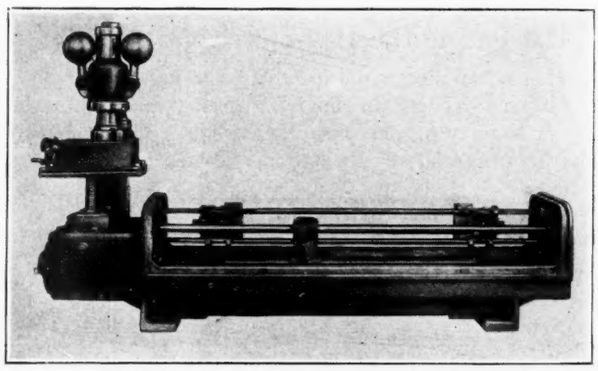

FIG. 1. VULCAN IRON WORKS FLYBALL GOVERNOR OVERSPEED DEVICE, COVER REMOVED

sprocket wheel, which is chain-driven from another sprocket rigidly fastened to the mainshaft of the hoist. This main horizontal spindle is also arranged to drive by means of bevel gears, the vertical spindle carrying the flyball governor.

The threaded spindle works through a rider, sliding over a round rod, as indicated, and this rider moves backward or forward, depending upon the direction of rotation of the hoist. Two sets of controlling contactor fingers are provided, and these are adjustable in their position and are actuated by the rider. Two of these contactor devices are used for protection in the normal operation of hoisting coal and are set so that the rider will travel from one to the other while the cage is traveling from the bottom of the shaft to the dump.

The other pair of contactor devices are for landing protection, and are set so that the rider will make contact with one of them as each cage reaches the man, or surface, landing. These contactor devices are wired in the circuit, so that when they are actuated by the rider in its travel they will open the control circuit of the hoist motor and equipment, which automatically shuts power off the motor by tripping the main oil circuit breaker and also applies the air brake.

The flyball governor, which is driven at a speed proportional to that of the hoist, is arranged to open a contactor wired in the control circuit and shut off power and apply the air brake, should the speed of the hoist reach 10 per cent. above the normal operating speed. A retardation feature is also provided and operated from the flyball governor, which accomplishes

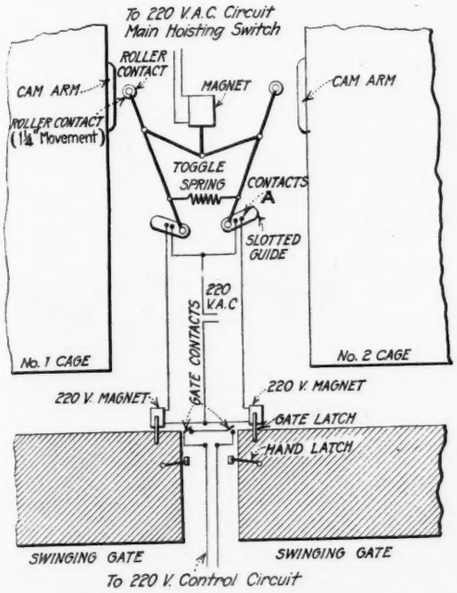

FIG. 2. AUXILIARY DEVICES AND SCHEME OF CONNECTIONS

an automatic slowing down of the hoist as the cage approaches the dump by opening, successively, the contactors controlling the amount of resistance in the rotor circuit of the motor, thus gradually and automatically inserting this resistance and slowing the motor down.

This motor resistance is arranged so that the cage must approach the dumping horns at approximate speeds not greater than 1200 ft. per minute at a distance of 25 ft. below the dumping point, 900 ft. per minute at a distance 20 ft. below the dumping point, 600 ft. per minute at a distance 15 ft. below the dumping point and 300 ft. per minute at a distance 10 ft. below the dumping horns. This requires that the hoisting engineer must apply his brake properly each time a hoist is made. If this is not done, all contactors and the main oil circuit breaker are opened, cutting power off the motor and applying the air brake.

In first considering this problem of safety gate protection it was thought that a mechanically or electrically operated device to actually open and close the gates would be required. Accordingly, such an equipment was designed and drawn up. It consisted of steel gates provided with rollers at the bottom running in steel guides, the gates having a rack attached to them, through which they were to be opened or closed by an electric motor having a pinion on its shaft in mesh with the rack on the gate. By means of an automatic contactor control system for the motors, these gates were arranged to automatically open when the cage stopped at the man landing and to remain open as long as the cage remained there, and to close automatically just as soon as the cage left the man landing, either going up or going down.

The contact-making device controlling all this automatic operation was to be supported from the guides and to be engaged by a wheel on the cage. It was designed so that in the normal operation of hoisting coal there would be no engagement between the contact-making device and the wheel on the cage, this only being effected when the man-landing switch of the control system was closed, which had to be done before men could be hoisted. The gate-operating motor was to be equipped with a solenoid brake arranged to be applied fully to hold the gate at the end of its travel in each direction, either completely open or tightly closed.

Estimates covering the cost of this proposed scheme showed that it would be comparatively expensive and require a considerable time for its production, so the whole scheme of a mechanically or electrically actuated gate was held in abeyance and the problem approached from another angle.

Reference to the safety requirements as outlined by Art. 8 of the Pennsylvania Bituminous Mine Law was had in order to obtain all the detailed information possible. This article of the law reads as follows: "All shafts shall be provided with safety gates controlled by the cage at the top and intermediate landings, and said gates to be approved by the inspector."

In analyzing the basic intent of this law it seemed clear that safety was the fundamental requirement and that there was no intent in the law to circumscribe or prescribe the specific means by which the safety features were to be secured or to require certain methods of securing this, to the exclusion of all others. Consequently, it was believed that there was no sound rea-

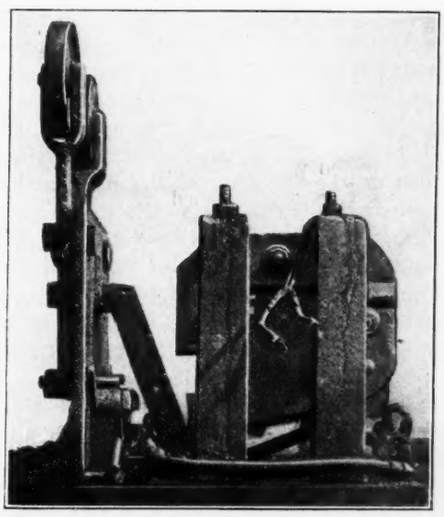

FIG. 3. TOGGLE, TOGGLE MAGNET AND ROLLER CONTACT ARMS

son for interpreting the law to be satisfactorily complied with only by gates mechanically or electrically opened or closed. Therefore, in seeking the second solution, there was eliminated entirely the proposition of any mechanical or electrical devices for actually opening or closing the gate.

It was thought that the complete protection that the law sought to obtain would be provided by fulfilling the

two following conditions: (1) The shaft gates must be at all times locked in the closed position, except when men are being hoisted, and then only when the cage is directly opposite the man landing. (2) In the event that the shaft gate is left open for any reason the hoist will be rendered inoperative, and it will not be possible to move the cage an appreciable distance either up or down.

Believing that if the two basic requirements as above stated were met the safety standard would be complied with in every possible way, some solution was sought which should completely satisfy these conditions.

Having in mind the excellent protective features provided by the flyball governor overwind device, for all contingencies and emergencies which might occur in the normal operation of the equipment in hoisting coal, and in man-landing protection, it seemed but natural to the man to whom this problem was presented at this time that this device operating in conjunction with some specially designed auxiliary parts might be made to meet also the additional requirements of complete safety gate protection.

This proved to be the case, but in order to get a clearer idea of the way in which the normal operation of the device was modified by the auxiliary devices designed, the operation in the normal hoisting of men will be outlined. This is as follows:

In the operation of hoisting men, the bottom cager gives the usual man-hoisting signal, in this case three bells. The hoist operator then closes a single-pole, 220-volt switch on the operating platform. This switch places the man-landing features of the overwind device in operation, and at the same time energizes a signal light at the top of the shaft or surface landing and a signal light on the hoist dial; also a signal light at the bottom landing of the shaft. Upon noting the light, the bottom man signals the hoist operator to start, knowing from the signal light that the man-landing features of the overwind device have been placed in operation. If for any reason the hoisting engineer should fail to shut off the power and apply the brakes just as soon as the cage passes the man landing, the power is automatically cut off and the air brake applied, thus bringing the cage to an absolute stop before it reaches the dumping position.

In the actual mechanisms applied to the overwind device no originality is claimed, as they are in daily service on some types of automatic push-button control elevators; but the feature of selective operation, whereby the safety gate at the man landing can only be opened when hoisting men, and then only when the cage is directly opposite the landing, is possibly new in its connection with and application to the type of overwind device on this hoist.

Referring to Fig. 2, which shows the auxiliary devices and the scheme of connections, a roller contact device is attached to each of the two cages. A collapsible toggle, having two arms, is attached to an "eye" beam between the two shafts, this toggle being operated by a 220-volt magnet, as indicated. It is located so that when the magnet is energized the two arms are thrown out into such a position that each may be engaged by the roller contact device on the cage in that shaft over which the arm projects. Each gate at the man landing is held closed by a bolt, which is arranged to be raised by a magnet whose winding is energized from the 220-volt control circuit, and is wired in series with the contacts which are opened and closed by the toggle arms. In the normal operation of hoisting coal the toggle magnet is not energized and the toggle collapses, the roller contacts on the cage not engaging the toggle arms.

When men are to be hoisted the hoisting engineer, by closing the single-pole switch which places the man-landing overwind in operation and lights the signal lamps, also energizes the 220-volt toggle-operating magnet, which throws the toggle arms out into position where they may be engaged by the roller-contact device on the cage. When the cage comes exactly opposite the man landing, the roller contact on the cage engages the toggle arm and causes this to close the circuit to

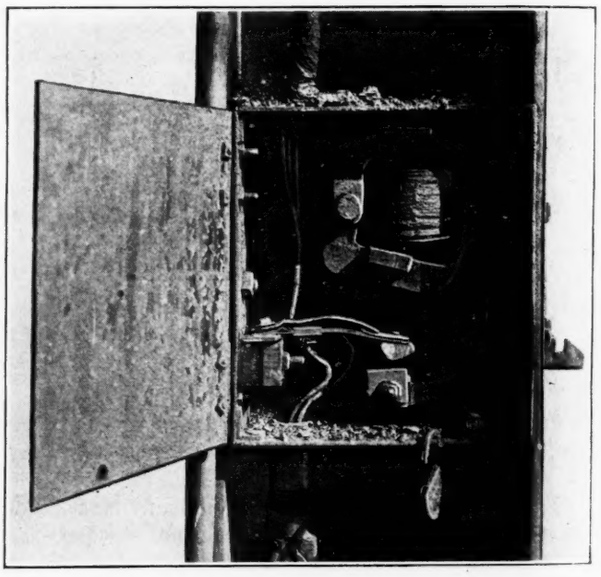

FIG. 4. MAGNET WITH GATE BOLT, GATE LATCH AND INCLOSING BOX

the gate bolt magnets, and lifts the gate bolt, which permits the gate to be opened. The control circuit of the hoist is wired in series with the contacts which are closed by the gate hand latch. As soon as the hand latch is released and the gate opened, the control circuit is broken, all contacts opened, and therefore the air brake automatically applied to hold the hoist fast with the cage at the man landing. As long as the control circuit is open, the hoist is inoperative and cannot be moved.

In order to prevent the operator from opening the single-pole switch placing the man-landing protection in operation, before the cage has reached the landing, this switch has been arranged so that it cannot be opened unless the air brake is applied. This is accomplished by a magnet which holds the switch fast after it is once closed, the windings of this magnet being energized when the switch is closed. The air brake of the hoist is provided with a contact actuated by the piston, so that when the piston falls, which it does when the air brake is applied, it opens the 220-volt circuit of the magnet holding the double-pole switch closed, and this switch may then be opened.

While the opening of the single-pole man-landing switch would not in any way affect the safety gate protection, inasmuch as the gate could not be opened until such time as the switch was thrown in again, it does affect the safety protection as installed by the hoist builders for hoisting men, and this additional protective feature was incorporated to comply with the wishes of the mine inspector.

In the application of these auxiliary devices the mechanical details were made at the shops of the mine. The magnets and cores for the toggle operation were such as are standard in the equipment of mine-hoist motor contactors, while the magnets and cores used for the gate bolt-lifting mechanism are standard as used on the control boards of push-button-operated elevators.

The fact that the brakes of the hoist are air-actuated and that all operations are dependent on one 220-volt control circuit, taken in conjunction with the application of the type of flyball governor overwind device, has made more easily possible the accomplishment of the complete and comprehensive safety features provided.

It is considered that every safety requirement has been fulfilled, and this with a minimum of operating parts and resulting complications. It may be further pointed out that if from any cause outside normal operations the 220-volt control circuit is broken, that the power to the hoist motor is automatically cut off and the air brakes applied.

The fact that the gates have to be manually operated is thought to be an additional safety feature. With a mechanically or electrically lifting gate, there is always the possibility of the gate striking a person, with resulting injury. With a mechanically or electrically operated swinging gate there is the possibility of sweeping a person into the shaft. With the manually operated gate there is no possibility of injury as the hoist is inoperative until the gate is closed and the control circuit completed.

The flyball governor overwind device had been operating satisfactorily for more than a year previous to the application to it of the safety gate protective features, about ten months ago. Since that time both have been operating together with perfectly satisfactory results.

It is hoped that this article may be of benefit to others having a similar problem to solve; also that it will prove of general interest to many operators of electrically driven hoists.

Combustion of coal is not a simple oxidation of carbon and hydrogen to CO_2 and H_2O, but is a complex process. The volatile matter from heated coal contains tar, saturated and unsaturated hydrocarbons, carbon monoxide and hydrogen, all of which must be burned in the space above the fuel bed. These materials all react among themselves and with the products of their combustion. Each reaction exerts its influence upon the others and can not be considered separately. The high temperature in the furnace favors the formation of simpler compounds so that the final products to be burned are largely soot, CO and H.—*Bureau of Mines Bulletin No. 135.*

Important Development of Large Coal Tract in Greene County, Pennsylvania

The development of a 7600-acre tract of coal land in Greene County, Pennsylvania, by the Buckeye Coal Co., has reached such a point that shipments of coal are about to take place. The Buckeye company is a subsidiary of the Youngstown Sheet and Tube Co., and the coal plant at Nemacolin, Penn., will supply coal to the byproduct plant of the parent company at Youngstown, Ohio. It is expected to make the Buckeye operation a model plant with a capacity of 6000 tons of coal daily, giving employment to some 1500 men. The Buckeye mine is said to be the first development on a large scale in Greene County, and likely the mine will not reach full capacity for several years. Shipments will be made at present by water or until the completion of a railroad spur from Crucible, eight miles distant.

The main openings to the coal at this plant are shafts about 250 ft. deep and lined throughout with concrete; a unique feature of the airshaft is its circular section —being 20 ft. in diameter. The main or hoist is elliptical in cross-section. Considering the large daily tonnage desired, it was decided to hoist the coal in skips instead of by cages; this is in line with recent developments made at some mines which are expected to become record producers.

The air shaft is completed and a fan has been installed with a capacity of 400,000 cu.ft. per minute. Other mine openings at this plant include a man and material slope 857 ft. long driven on a 19 deg. pitch and concreted from the surface to the coal. Until the completion of the main shaft and tipple, the product of the mine is hoisted through this slope and onto a temporary tipple—six cars per trip. A shop equipped to handle all ordinary mine work and repairs has been erected and equipped.

Especial attention has been paid to the housing problem at Nemacolin. Houses for the superintendent, chief engineer, store manager and doctor have been completed. There have also been built 120 houses for the workmen; of these 80 are five-room dwellings and 29 are six-room houses. To add to the comfort of the employees, 76 of the houses have been equipped with hot air furnaces; 35 houses have bathtubs while the remainder have showers. Every house has a toilet and electric lights. Some 400 acres have been reserved for a town site on a knoll overlooking the Monongahela River; the town covers about 50 acres.

The sanitary condition of the Nemacolin community has been provided for in a sewage disposal plant which has been constructed with the approval of the State Board of Health. Both Protestant and Catholic churches will be built, and plans have been completed for a six-room school building with provision made for additions. The streets of the town will be named after the leading generals of the recent war. The main thoroughfare will be known as Pershing Boulevard; other streets and avenues will be named Foch, Haig, Petain, Diaz, Bliss, Wood and Joffre respectively. The local officials of the Buckeye Coal Co. are C. M. Lingle, general manager; W. H. Gages (formerly mine foreman of the Frick company at Connellsville), superintendent; A. W. Hesse, chief mining engineer, and G. F. Bell, chief clerk.

Mudding Coal at St. Eloy, France*

SYNOPSIS—*The French feed mud into the crevices of the coal in heated ribs so as to extinguish the fire in them. This mud may be fed in from the surface or forced in from below, a tank being preferably used as the immediate means of delivery. Apparently the operation of the tank by compressed air has been found greatly preferable to the use of such water pressures as are apt to be available. Moreover, water operation is wasteful of water and slower than air pressure.*

THE flushing method is the most efficacious means for the fighting of mine fires. It was already practiced at Commentry[1] before 1878, and H. Fayol, in his study of the fires of that mine in the *Industrie Minérale*, 1889, shows the excellent results obtained by that process. The material was delivered not only from the surface but also from the mine, the flushing material being placed in the latter instance by diaphragm pumps which forced the material to be flushed into a borehole that sloped upward in the coal.

This process, which will be termed the "process from below," is still practiced in many mines, the muddy liquids being forced into the coal by pumps, as at Monteau-les-Mines, where disk and ball pumps are still used.

In the application of the process from below, an innovation was introduced at the mines of Aubin, in 1910, by M. Clavelly. This consisted in the use of a flushing tank which was described in the *Bulletin* of September, 1912. It was an iron tank, or barrel, connected at one side with a water line under pressure and having, at the other side, a valve through which the flushing material was ejected.

The flushing materials were introduced in the tank by an opening fitted with a self-closing device. They were carried off, of course, by the flow of water, the liquid being agitated from the outside so as to mix the material with the water, thus permitting it to be flushed into the borehole.

At St. Eloy, flushing from below has been practiced since September, 1915. At first a flushing tank identical with the one used at Commentry was used to deliver flue ashes, but a great quantity of ashes was quickly used up and the available stock at St. Eloy and in the neighborhood soon ran out.

For this reason, the management proposed the use of washery waste with 50 per cent. of ashes, the former being valueless material of which there was practically an inexhaustible stock. But this waste is much heavier than flue ashes, and using the same velocity of ejection half the material was left at the bottom of the tank. To make it possible to use these wastes, it was necessary to increase the speed of evacuation; and for this purpose the pressure of a compressed-air line was utilized to force the mixture into the boreholes.

The flush tank is operated by air pressure and is similar to that used at other mines, notably at the mine of the Companie de Béthune, where it was resorted to for strengthening the concrete lining of the heading by an application of cement grout.

It is an iron barrel (Fig. 1) into which is introduced the material to be injected and the water needed for the injection. It is fitted at its lower end with the outlet pipe *V*. This pipe is connected with the borehole, and at the top near one end is the tube *A*, connected with the compressed-air line. After the tank has been closed, the mixture is kept in agitation by a stirring device, operated by a handle from the outside. As soon as the material is well mixed compressed air is let in, and it forces the mixture into the borehole. As soon as the tank is empty, new materials are introduced, and the machine is again ready for operation. The water could be fed into the barrel by the opening by which the flushing material is introduced, but it is more convenient to connect with the water line through the pipe *E*.

Self-Closing Valve Saves Time

In order to avoid waste of time at each operation, the opening for the introduction of the material is fitted with a self-closing valve, which can be operated rapidly by a lever placed outside the tank. A second pipe *A'*, similar to the pipe *A*, is placed at the top of the tank. Through this the pressure of air is released before the tank is refilled.

The self-closing plug *R* is provided for cleaning purposes. The capacity of the tank is 119 gal. It is mounted on a truck, and the whole apparatus weighs 1610 lb., the tank weighing 1221 lb. and the truck 388 lb. The mines at St. Eloy have now three flushing machines of this type.

The rapidity with which the material is flushed depends on the effective pressure of the water or of the air with which the tank is supplied. When compressed air is not used, the effective pressure at the flush tank is much lower than the static pressure of the pipe lines, on account of the large loss of head in the pipes. A head of 197 ft. was used, but the pipe line was about 1312 ft. long, and the pipe had an inside diameter of only 1.29 in.; moreover, it had many elbows. The speed of the water reaching the empty tank was only about 3.28 ft. per second, corresponding to a theoretical effective pressure of 2.15 in. of water.

When the flushing tank is filled up and is delivering a flow in the borehole, the speed is still lower because of the resistance of the coal to the passage of the fluid. Thus slowed down, the speed of the current is not sufficient to carry along the heavy elements in the flushing material.

The use of compressed air at a pressure of 56.9 lb. per sq.in. gave the material a theoretical speed of 82 ft. per second, assuming a specific gravity of the fluid mass such as to reduce the value of the head from 131

*Abstract of Chapter I of an article by M. A. Plassard, assistant manager of the West Canadian Collieries Co., Ltd., published in the Bulletin de la Société de l'Industrie Minérale. St. Eloy is about in the geographical center of France in the Department of Puy de Dome. A small basin of coal takes its name from St. Eloy.

[1]Commentry is located near St. Eloy, but in another coal basin.

ft. to 104.6. In fact, because of the resistance of the borehole, and because of the presence of a small quantity of air in the water, and of various corrections to be made to the theoretical formula, $v = 2gh$, the theoretical speed is not as significant as it at first seems. The actual speed is more readily determined by an observation of the time needed to empty the flushing tank; 119 gal. flows out through an orifice of 1.31 sq.in. in about 30 seconds, when the resistance to mudding is at a minimum.

When the resistance of the cracks increases, the speed of evacuation decreases; but it is nevertheless sufficient to carry away all the breaker refuse so long as mudding is continued. The same result would obviously be obtained with the flushing tank if water pressure only were used; provided that sufficient effective pressure were available. Lacking such free head, a pump can be connected with the intake line, and it will provide the required pressure.

The air acts on the fluid mass like a piston and does not modify the proportion of water. In using the flushing machine with water pressure, or rather with a water current, the water continually thins the initial mixture, the operation being stopped when the mixture is sufficiently thin. This necessitates using an inflow of water equal to at least twice the capacity of the flushing tank.

Even if the pressure obtained with water is readily made equal to the air pressure, the difference in operation would still give the air pressure an advantage as regards consumption of water and speed of operation. The speed of evacuation when compressed-air is used being amply sufficient to carry away the material without leaving any residues in the tank, the outlet pipe has been placed at the lowest point in the tank. So disposed, it is possible to utilize the full capacity of the flushing machine.

It is obvious that elements that are too bulky cannot be profitably introduced into the flushing tank. Such materials are frequently found in flue ashes. They comprise clinkers, broken bricks and clay lumps, the last of which break up but little when thrown into water. Large quantities of coarse material are found also in the basins, where the waste from washeries is drained away; so the washery waste does not flush without residue unless screened.

To clear the flushing material of those undesirable elements, it is passed over a screen pitching at an angle of 45 deg. with 0.78-in. (20-mm.) round holes. The flushing tank can be operated by two men, or even by a man with the help of a boy. When the flush tank is empty, the water inlet is opened, and the material is introduced by shoveling it into a removable funnel. The assistant aids the material to slide into the tank. The loading being done, the attendant waits until the water has completely filled the tank, when the water inlet is shut.

The agitator is then turned a little, to render the mixture homogeneous, the air inlet being opened meanwhile. The lowering of the slush in the tank is soon evidenced by the fact that the pallets of the agitator turn with greater ease.

As soon as the tank is empty the compressed-air inlet is shut and the air outlet opened. In this way no compressed air is forced into the coal which is being mudded. In fact, the discharge of air in place of water and mud into the heated mass would, if it occurred, be one of the objections to using compressed air for fire mudding. But the process described above makes it unnecessary to discharge any important quantity of air into the borehole. All that does enter passes in with the water and is the outcome of the agitation of the mixture during the discharge of mud.

However, the discharge of air into the borehole would seldom do any great amount of harm. The coal to be flushed may be classified as follows: (1) Coal in a

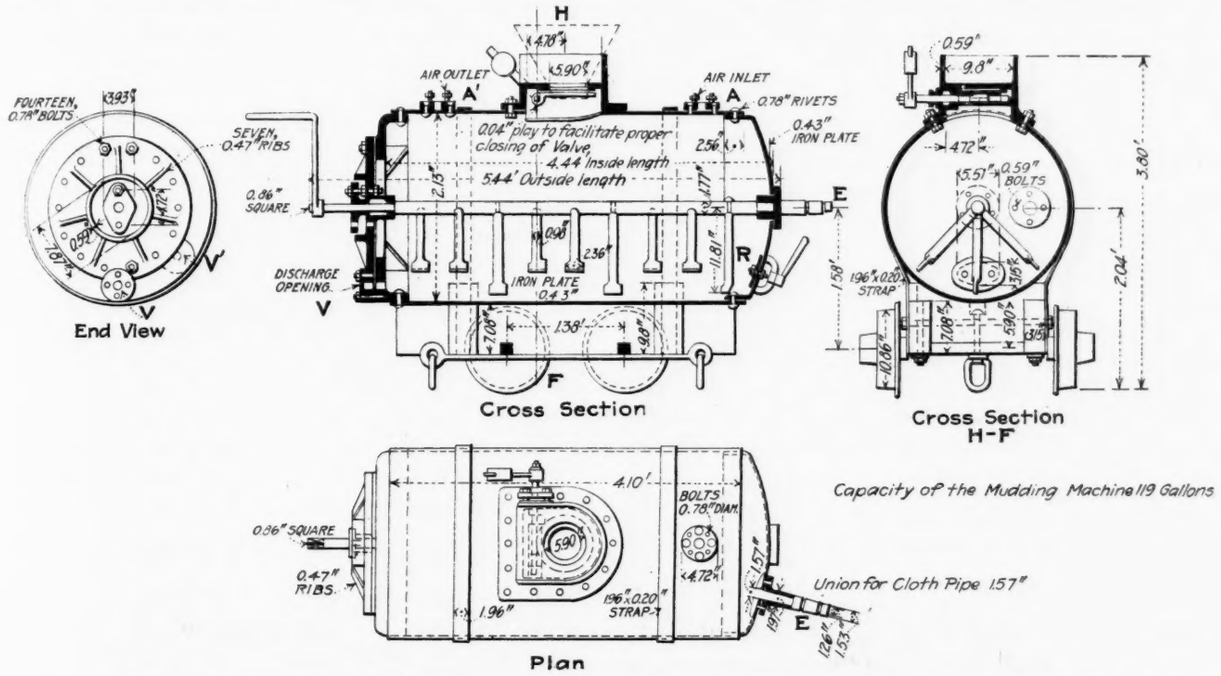

FIG. 1. MACHINE FOR SMOTHERING FIRES IN COAL BY INJECTING MUD INTO THE CREVICES

cold or little heated district, where the flushing is merely preventive. (2) Ribs in such mine areas as it is necessary to keep open, and which are generating combustible gas and developing points of spontaneous combustion. These ribs include those of abandoned roadways where the roadways have not been filled with refuse. (3) Ribs on fire.

The first case is by far the most usual one in the methodical handling of a fiery mine, and here the entrance of air into the borehole does not create any inconvenience. In the second case, air might favor the formation of an explosible mixture. For this reason its introduction must be carefully avoided. In the third case, the air would of course intensify the fire, but the effect of the air would decrease as the flushing material accumulated.

Flushing Is Done by Compressed Air

It is possible to avoid any forcing of air into the coal, but should such an untoward accident happen there are few cases where it would entail serious inconvenience. In the flushing work at St. Eloy, the compressed-air method has been used in all cases, even without using the air outlet, for that adjunct has only recently been added to the flushing tank. Yet no inconveniences were experienced from air forced into the coal.

However, if danger seemed probable in any particular case, an immediate transition from the compressed-air method to the hydraulic method would allow the operator to continue the flushing with entire safety. The same apparatus, in fact, can be used with both water pressure and air pressure; all that is necessary is to have in store materials sufficiently light for such pressure as is available.

If the materials in use are so large that residues are left, the only provision necessary is that the outlet for the muddy fluid be high enough above the bottom of the tank to be free of possible accumulations of the material, the residues of several flushing operations. The old water intake *E*, placed at the mid-height of the tank, may be used as outflow pipe and the water be introduced by the former outlet pipe *V*. With a view to avoiding even that change, which would make it necessary to bring the flushing apparatus to the surface, a second outflow pipe *V'* was added to the flush tank so that the method of operation could be changed without any difficulty by simply transferring the connection from *V* to *V'*.

Use Auxiliary Tank to Keep Air From Coal

Where no light materials are available, it is sometimes necessary to operate under high pressure even where it is essential to keep air entirely out of the coal and where no high-pressure water supply can be secured. In such a case compressed air could be utilized, but it would have to be delivered to an auxiliary apparatus, the water entering the flushing tank under pressure. If a hose pipe were used to connect the two tanks, it would be easy to obtain from its movement a warning of the moment when the air of the first apparatus started to pass into the flushing tank.

At each operation the flushing tank received half a mine car, or 9.35 cu.ft., of ashes or breaker refuse, which occupies space which would accommodate 70 gal. of water. The actual water displacement of the materials, however, will be 20 per cent. less than their volume. What occupies the same volume as 70 gal. of water will displace only 58 gal. of water. The tank holds 119 gal. so, roughly speaking, the volume of water used is equal to the space occupied by the material. With two men, 4 minutes is needed to introduce the materials, 2 minutes to agitate the mixture and empty the tank. Hence it is possible to charge, make and discharge the mud in 6 minutes if the inflow reaches or exceeds 15 gal. a minute. At St. Eloy the inflow of water was slow, and the complete operation required at least 7 minutes.

In practice, this rapidity of operation cannot be attained because of the difficulties in placing the cars loaded with flushing material. Then there are unforeseen circumstances such as obstructions in the pipe lines. As a result the record at St. Eloy hardly exceeded four complete operations an hour, corresponding to about 35 cu.ft. of introduced materials. The volume of air used, measured at the line pressure, is roughly double the volume of the materials; that is to say, it is at most 70 cu.ft. an hour, a negligible quantity.

As stated, the main advantage of the use of compressed air was that it enabled us to utilize materials which were too heavy for use when using such water pressure as was available. But operation with air has made the work three times as quick as with water pressure and has required only one-sixth part of the water needed when water pressure was the motive power.

To establish a comparison between the two plans of operations, the broad outlines of the operation with water may be outlined briefly. The flushing apparatus had a capacity of 119 gal. and an effective head at the flushing machine of from 1.96 in. to 2.75 in.

Operation Under Water Pressure

At each operation, 9.35 cu.ft. of flushing materials, or the equivalent of 70 gal. of liquid, are introduced. The end of the previous operation leaves the flushing apparatus full of water, so it is necessary to empty 58 gal. of water by opening the cock on the discharge line, thus making room for the materials to be introduced which, dumped into the water, will add 58 gal. to the volume of that fluid.

The flushing apparatus is then closed, the agitator is put in motion, and the water-inlet valve is opened. By degrees the materials mixed with the water are carried away. When the resistance of the pallets has sufficiently decreased, the water is shut off. About one-sixth of the charged material remains in the tank after each operation, so the moment suitable for stopping the operation is not clearly defined; but it is better not to extend it too long, as the consumption of water is in proportion to the duration of the operation.

After every third operation, the residues must be cleaned out by the mudhole *R*. The average length of time occupied by a complete operation is 40 minutes, including 5 minutes for emptying half of the tank and introducing flushing material, 20 minutes for forcing mud into the borehole and 15 minutes for cleaning out the residues, handling the cars and miscellaneous unforeseen delays. The speed of operation when the

resistance to mudding is light is 1½ operations per hour, corresponding to 9.35 cu.ft. × 1.5 = 14 cu.ft. of material, from which one-sixth that is residue has to be deducted. As a result only 11.7 cu.ft. of materials per hour are delivered instead of 35.3 cu.ft. with the air method, which works more rapidly and does not leave any residue.

The consumption of water is given by the product of the time the evacuation lasts with the flow of the water current during that time. For that flow we will have a figure close enough, though too high, by taking the flow of the intake current in the empty flushing machine. When we flushed with water pressure, that flow was about 13 gal. (50 liters) per minute, which gives for the 20 minutes of evacuation a flow of 265 gal. (1000 liters), to which must be added half the capacity of the tank, or 60 gal. (225 liters), for the tank must be emptied at the beginning of the operation, and also one-third of a full tank (40 gal.), because the tank must be emptied at every third operation, so that the residues can be cleaned out. Consequently, the consumption of water totals 365 gal. (1395 liters), and this flushes a space of about 9.35 cu.ft., equivalent to 220 liters, or 58 gal.[2]; that is to say, about five times as much water is used as material flushed, whereas with the air method the water used and the material delivered are roughly equal.

Problems Connected with Mining at a Depth in Great Britain

George Blake Walker (president) in his inaugural address before the Institution of Mining Engineers of Great Britain, dealt largely with the future conditions of coal mining. He stated that the seams comparatively near the surface were about exhausted and that as mining was prosecuted at greater depths the rock temperature increased. At one operation near Doncaster the men suffered from boils and anemia, and their working efficiency was reduced 20 per cent.

It is of great importance that the mine ventilation current should have as little effect on the rock exposed in the entries and other mine workings as possible. As airways and entries which have a smooth surface cause less friction to the ventilating current than those which are less smooth, for this reason, it was noted, cement linings on airways had been used largely in some French collieries—notably at Courrières. This practice is said to be quite economical. The airways were roughly shaped to a circular or oval form and were then coated with a shell of cement a few inches thick by means of a cement gun. The principal value of this coating is in preventing leakage of air into the gob and the heating of the intake air from old mine workings or gobs.

In the Doncaster district the seam underlying the Barnsley bed is utilized for ventilation; intake or return airways are driven in this seam independent of the workings in the Barnsley bed. This method permits of the separate ventilation of panels and districts so that, should excessive temperature prevail in a certain section, it could be reduced and the workmen be protected. This system would seem to lend itself admirably to a plan which might include the cooling of the mine air at some future time. Refrigerating apparatus has been considered in this connection as making it possible to reduce the temperature of a large volume of air 10 deg. at comparatively small cost.

Mr. Walker notes that if we have reached a point where underground workers have become inefficient then the human element would have to give way more or less to mechanical appliances. Coal-cutting machines have been in use in English mines for many years, but hitherto this apparatus has been largely confined to the thinner seams. It does not seem that their use has been considered economical in seams thicker than 4 ft., but when these machines are to be used in workings in which excessive temperatures prevail then they likely will be introduced into the thicker beds. Explosives would largely be done away with at great depths as here the coal would break down quite easily under pressure. Furthermore, the animal haulage which has been supplanted by mechanical means in recent years would have to undergo further reduction as the mines became deeper.

In sinking to coal at a depth of 3000 ft. and over a large expenditure must be made for shafts. Shafts as now constructed are made 20 ft. and more in diameter, and two such openings might easily represent an expenditure of $300,000 irrespective of equipment. This development might only be justified when areas of 5000 acres or more would be tributary to the shafts in question. But the difficulties of high temperature would tend to limit the extent of the workings; in this case shafts would have to mine out smaller territory, which might be prohibitive to private capital and require state action. Eventually it would be a question of the cost of mining the coal, making the expenditure not worth while.

The International Geological Congress recently issued a report on the coal resources of the world and estimated the total probable reserve at 7,397,550 million tons. Of this amount Great Britain has one-fortieth, while the whole empire controlled about one-fourth. The fact that the United States, whose competition must be considered more than ever in the immediate future, possesses more than half of the world's supply of coal, makes it necessary to conserve this (Great Britain's) supply. Furthermore, this estimate of coal reserve was based on being able to mine coal to a depth of 6000 ft. from the surface. The British Royal Commission on Coal Supplies settled on a depth of 4000 ft., below which it would not be profitable to mine coal. However, Mr. Walker suggests that these depths are open to criticism and the available quantities of coal were greatly overestimated. The Royal Commission on Coal Supplies reports 39,483,000,000 tons available in Great Britain; if this quantity were reduced by 20 per cent. it would leave 31,586,400,000 tons. As the production of British mines for 1910 to 1914 inclusive was an average of 270,000,000 tons per annum, then the reduced reserve would be exhausted at this rate in 116 years.

In connection with the depth at which mining might be profitably carried on it was suggested that if conditions were unfavorable at 3000 ft. (already practically reached at Doncaster), then it would seem to be useless to estimate at depths between 3000 and 4000 ft.—much less at the greater depths of 5000 and 6000 feet.

[2]Seventy gallons less one-sixth residue, which by chance is the same figure as that given for the water displacement of the flushing material.—[Editor].

Baltimore Coal Trade in 1918

THE year 1918 came into being with weather records the lowest in the history of the Federal Weather Bureau, and nearly twenty thousand homes in Baltimore out of all classes of coal. Industrial Baltimore was so short of fuel that many plants worked only part time, some being forced to close for brief periods because of lack of coal. Even the public utilities ran short, and the words "coal famine" were the mark of a reality and not a mere figure of speech. Many schools and churches suspended for a time. Such was the condition through much of January and February.

The year ended with the glow of peace spreading over the world, with a cancellation of war contracts and with the release of coal for industrial and domestic purposes in such volume that all thought of famine is at an end for the time being.

Of the new year there is not much to relate so far, save that it has all the earmarks of bringing rehabilitation changes to business that must be overcome before the fuel industry is again on a truly stable competitive basis following the release of all Government control. It can be said, however, that the trade holds a confident view for the future. That no firms of real consequence went to the wall during the trying days of the war is a subject of congratulation, and it is the belief there will be a bigger business here in local trade, coastwise and export movement than was recorded in the banner seasons of 1914 and 1915, when the export movement for the first named year ran well over a million tons and for the latter a round two million tons.

Pier Facilities Considerably Enlarged

In the past few years Baltimore has swung into a new position as to the possibilities of modern coal handling. The pier situation here, for instance, is interesting. When Baltimore made its first real bid for export business it had an antiquated pier at Canton owned by the Pennsylvania; now there has been completed there a giant new pier of modern design. The old Curtis Bay pier of the Baltimore & Ohio had its decided limitations; now there is a remarkable pier of modern belting-system handling which alone could dump 12,000,000 tons a year, and which has set world records in loading. It was at this pier that the "Tuckahoe," the ship constructed by the Shipping Board in 27 days, was loaded in two hours and fifty minutes. The Western Maryland's pier at Port Covington was only a moderate factor, and the Locust Point pier of the Baltimore & Ohio was merely a harbor-delivery point of moderate capacity in years gone by.

After the Fuel Administration control and the drop in the immense coal handling here by reason of war conditions the pier business vastly decreased. Curtis Bay kept running on navy, Shipping Board and some coastwise coal when bottoms could be secured; Locust Point and Port Covington were closed, and the Canton pier of the Pennsylvania was used for economy sake by the Railroad Administration to handle all harbor delivery, Baltimore & Ohio, Pennsylvania and Western Maryland shipments. With the splendid pier facilities here of all coals, however, and the prospect of a large export and coastwise trade as soon as vessel bottoms are released for general water movement, Baltimore seems due for the greatest coal-handling records of her history.

Industrially Baltimore too is prepared to go ahead. Many great plants that handled war work and the public service corporations have installed modern coal-handling machinery. One of the finest coal handling plants in the country is owned by the Consolidated Gas, Electric Light and Power Co., of Baltimore, at its Westport power branch. This tower is one of four units of the coaling equipment at the plant. Still another unit is under construction.

Of the immediate past in the coal trade here it is to be recorded that the months of 1918 in this section were about a duplication of the conditions all over the east. Soft coal supply was desperately short all during the winter months, and while some relief came through in the spring, there were constant complications from war conditions and Government control. Changes to jobbing methods, regulation of production as to quality and price changes at frequent periods, priority rules that were set and upset, commandeering—all are too vividly remembered to be repeated at length.

Demand Drops with Signing of Armistice

The signing of the armistice found the soft-coal trade a little easier here as to supply, as most industries had been able to stock up with fuel, even if it was of very inferior grade in many cases. After that time the increasing releases of the better coals caused an easy market, in which there was some price cutting. As a whole, however, the trade rounded out the soft coal year in good form and with good prospects.

The anthracite situation during 1918 was ever a serious one until after the armistice was signed. The year was begun with thousands of homes in this city without fuel, and only the most expert handling of the situation by the retail coal dealers, with approval of the fuel administration, saved a much worse situation. Baltimore ended the real winter season in March pretty well cleaned out of all hard coal. It was estimated that the suburbs and city would need a total of 896,345 tons for the coal year—based on a consumption in 1916-17 of 657,921 tons in the city and 63,428 tons in the immediate suburbs, a total of 721,349 tons. The balance was asked to cover stored shortage, cellar replacement, increased population needs and increased burning by several industries which were included in the allotment. The request was rejected, and Baltimore was allotted 713,316 tons for the city and 61,000 tons for the suburbs. Up to Nov. 11 on this allotment the city and suburbs had received less than 450,000 tons. Because of the two-thirds delivery plan and the fact that many consumers had undoubtedly managed in some way to get practically their full allotment, while the corporation demand for hard coal had cut heavily into the apportionment received, the day of the signing of the armistice found 12,920 homes in the city still without coal, as shown by a public census. Heavy receipts since then, however, have relieved the situation entirely.

With December figures off, they not having been compiled by the local fuel administration, the hard coal situation here by months was as follows:

	Received, 1918	Received, 1917	On Hand End of Previous Month	Tons Delivered	Tons Not Delivered of Two-Thirds Plan
April	67,174	50,681	30,809	69,304	267,761
May	55,757	66,782	32,555	66,928	270,837
June	58,773	64,751	22,968	58,312	263,819
July	49,271	59,929	21,772	55,037	233,434
August	50,750	45,415	16,958	37,582	199,245
September	57,314	44,428	22,276	50,704	162,270
October	45,406	37,178	21,777	57,504	103,081
November	45,618	46,905	35,123	40,135	84,073

During the progress of the war little complaint was heard from the public about price increases, most of the consumers recognizing that freight and wage increases and mounting overhead charges made the moves necessary; but the dealers at the close of the year were feeling the effect of the high rates through cancellation of orders still on the books following the warm weather and the thought in the public mind that the ton price is now so high as to be avoided as far as possible. Comparative prices here for the present market, as set here Nov. 9, and for Sept. 9 and September of 1917, are given herewith:

	Nov. 9, 1918	Sept. 9, 1918	Sept., 1917
Hard, No. 1	$11.90	$10.85	$9.20
Hard, No. 2	11.90	10.85	8.90
Hard, No. 3	12.15	11.10	9.15
Hard, No. 4	12.25	11.20	9.30
Pea	10.40	9.31	8.30
Buckwheat	8.60	8.60	6.70
Lykens Valley, No. 2	12.60	11.55	9.65
Lykens, Valley, No. 3	13.00	11.95	9.90

Deep down in the hearts of the coal men here there is probably little regret that 1918, a year of constant uncertainty, is gone. The retailer had his problems and at times feared that Government regulation would put him out of the running or seriously interfere with his earnings; the jobber had to veritably fight for life at times, but came out triumphant; the operator had so many problems that his troubles were truly legion.

Denmark's Coal Supply

Denmark's fuel problem, states Erwin W. Thompson, United States commercial attaché at Copenhagen, in a recent report, was quite satisfactorily solved during the first four years of the war by a recourse to wood and peat, aided by the well-organized and quick work of Denmark's coal distribution committees. At the beginning of the fifth year of war, says Mr. Thompson, this coal question should be considered again, the more so as the conditions for production and the political conditions abroad do not give Denmark any bright prospects of a good supply for the coming months.

It early became evident, continues the report, that the coal question would be a most difficult one for the entente. In September a London paper said that the coal problem in England was serious. In the beginning of October the British coal controller stated that even if peace came soon, the coal problem would not nearly be solved. England lives from hand to mouth with regard to coal. The supplies are very small, and the military demands are swallowing a great part of them. France is at present consuming 6,000,000 tons more than the normal annual rate, and Italy's demands are very heavy.

It will therefore be understood that the decreased production is keenly felt at home. In the first half of 1918 the production in the United Kingdom was 117,000,000 tons compared with 127,000,000 tons in the first half of 1917 and 140,000,000 tons in the first half of 1914.

If we turn to Germany as the second largest supplier of coal for the Danish market, the prospects are still darker, as the labor problem and transportation difficulties must be taken into consideration. Transportation is the most difficult in the fall, on account of the harvest. This influences the neutral countries, both the Swedish and the Danish import having been on the decline in recent months.

When judging of the coal prospects for the coming winter, these general conditions in the producing countries must be taken into consideration, and some special conditions in connection with the latest foreign political developments. The freight on English coal to Norway was recently reduced from $20.10 to $6.70 per ton, but a similar reduction can not be expected in the Danish trade. A Danish reduction of the coal freight is, however, being contemplated in consequence of the reduction of the insurance premiums. The ship owners have not yet decided to make these reductions, and the importers are looking forward to it with some anxiety because it would mean a loss to them on their stocks. The possible result of this situation will be a decreased import. The British export price of 83 crowns per ton f.o.b. Newcastle for steam coal plus 77 crowns for freight and 14 crowns for expenses and profit to the importer, makes a selling price of 170 crowns ($45.56) in Denmark. It would therefore be desirable if the negotiations now going on could be made to give a favorable result for the consumers without hitting the importers too hard. Then, of course, the question is whether England will not meet a freight reduction by increasing her export price which, among the Scandinavian States, is highest for Denmark.

The prospects for a continued sufficient import from Germany are still darker, is Mr. Thompson's belief. Most of the ports from which Denmark got her supplies are now in the hands of the revolution. German coal is shipped partly from the Baltic ports, partly from the Elbe, Weser and Ems ports. From Emden on the Dutch border and via the Dutch city of Delfzejl several of the most important shipments were made along the North Sea coast up through Kiel Canal. This transportation is hardly possible under the present conditions, and upon the whole it is to be expected that German supplies will be very small for some time to come.

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Baltimore Coal Trade in 1918

THE year 1918 came into being with weather records the lowest in the history of the Federal Weather Bureau, and nearly twenty thousand homes in Baltimore out of all classes of coal. Industrial Baltimore was so short of fuel that many plants worked only part time, some being forced to close for brief periods because of lack of coal. Even the public utilities ran short, and the words "coal famine" were the mark of a reality and not a mere figure of speech. Many schools and churches suspended for a time. Such was the condition through much of January and February.

The year ended with the glow of peace spreading over the world, with a cancellation of war contracts and with the release of coal for industrial and domestic purposes in such volume that all thought of famine is at an end for the time being.

Of the new year there is not much to relate so far, save that it has all the earmarks of bringing rehabilitation changes to business that must be overcome before the fuel industry is again on a truly stable competitive basis following the release of all Government control. It can be said, however, that the trade holds a confident view for the future. That no firms of real consequence went to the wall during the trying days of the war is a subject of congratulation, and it is the belief there will be a bigger business here in local trade, coastwise and export movement than was recorded in the banner seasons of 1914 and 1915, when the export movement for the first named year ran well over a million tons and for the latter a round two million tons.

Pier Facilities Considerably Enlarged

In the past few years Baltimore has swung into a new position as to the possibilities of modern coal handling. The pier situation here, for instance, is interesting. When Baltimore made its first real bid for export business it had an antiquated pier at Canton owned by the Pennsylvania; now there has been completed there a giant new pier of modern design. The old Curtis Bay pier of the Baltimore & Ohio had its decided limitations; now there is a remarkable pier of modern belting-system handling which alone could dump 12,000,000 tons a year, and which has set world records in loading. It was at this pier that the "Tuckahoe," the ship constructed by the Shipping Board in 27 days, was loaded in two hours and fifty minutes. The Western Maryland's pier at Port Covington was only a moderate factor, and the Locust Point pier of the Baltimore & Ohio was merely a harbor-delivery point of moderate capacity in years gone by.

After the Fuel Administration control and the drop in the immense coal handling here by reason of war conditions the pier business vastly decreased. Curtis Bay kept running on navy, Shipping Board and some coastwise coal when bottoms could be secured; Locust Point and Port Covington were closed, and the Canton pier of the Pennsylvania was used for economy sake by the Railroad Administration to handle all harbor delivery, Baltimore & Ohio, Pennsylvania and Western Maryland shipments. With the splendid pier facilities here of all coals, however, and the prospect of a large export and coastwise trade as soon as vessel bottoms are released for general water movement, Baltimore seems due for the greatest coal-handling records of her history.

Industrially Baltimore too is prepared to go ahead. Many great plants that handled war work and the public service corporations have installed modern coal-handling machinery. One of the finest coal handling plants in the country is owned by the Consolidated Gas, Electric Light and Power Co., of Baltimore, at its Westport power branch. This tower is one of four units of the coaling equipment at the plant. Still another unit is under construction.

Of the immediate past in the coal trade here it is to be recorded that the months of 1918 in this section were about a duplication of the conditions all over the east. Soft coal supply was desperately short all during the winter months, and while some relief came through in the spring, there were constant complications from war conditions and Government control. Changes to jobbing methods, regulation of production as to quality and price changes at frequent periods, priority rules that were set and upset, commandeering—all are too vividly remembered to be repeated at length.

Demand Drops with Signing of Armistice

The signing of the armistice found the soft-coal trade a little easier here as to supply, as most industries had been able to stock up with fuel, even if it was of very inferior grade in many cases. After that time the increasing releases of the better coals caused an easy market, in which there was some price cutting. As a whole, however, the trade rounded out the soft coal year in good form and with good prospects.

The anthracite situation during 1918 was ever a serious one until after the armistice was signed. The year was begun with thousands of homes in this city without fuel, and only the most expert handling of the situation by the retail coal dealers, with approval of the fuel administration, saved a much worse situation. Baltimore ended the real winter season in March pretty well cleaned out of all hard coal. It was estimated that the suburbs and city would need a total of 896,345 tons for the coal year—based on a consumption in 1916-17 of 657,921 tons in the city and 63,428 tons in the immediate suburbs, a total of 721,349 tons. The balance was asked to cover stored shortage, cellar replacement, increased population needs and increased burning by several industries which were included in the allotment. The request was rejected, and Baltimore was allotted 713,316 tons for the city and 61,000 tons for the suburbs. Up to Nov. 11 on this allotment the city and suburbs had received less than 450,000 tons. Because of the two-thirds delivery plan and the fact that many consumers had undoubtedly managed in some way to get practically their full allotment, while the corporation demand for hard coal had cut heavily into the apportionment received, the day of the signing of the armistice found 12,920 homes in the city still without coal, as shown by a public census. Heavy receipts since then, however, have relieved the situation entirely.

With December figures off, they not having been compiled by the local fuel administration, the hard coal situation here by months was as follows:

	Received, 1918	Received, 1917	On Hand End of Previous Month	Tons Delivered	Tons Not Delivered of Two-Thirds Plan
April	67,174	50,681	30,809	69,304	267,761
May	55,757	66,782	32,555	66,928	270,837
June	58,773	64,751	22,968	58,312	263,819
July	49,271	59,929	21,772	55,037	233,434
August	50,750	45,415	16,958	37,582	199,245
September	57,314	44,428	22,276	50,704	162,270
October	45,406	37,178	21,777	57,504	103,081
November	45,618	46,905	35,123	40,135	84,073

During the progress of the war little complaint was heard from the public about price increases, most of the consumers recognizing that freight and wage increases and mounting overhead charges made the moves necessary; but the dealers at the close of the year were feeling the effect of the high rates through cancellation of orders still on the books following the warm weather and the thought in the public mind that the ton price is now so high as to be avoided as far as possible. Comparative prices here for the present market, as set here Nov. 9, and for Sept. 9 and September of 1917, are given herewith:

	Nov. 9, 1918	Sept. 9, 1918	Sept., 1917
Hard, No. 1	$11.90	$10.85	$9.20
Hard, No. 2	11.90	10.85	8.90
Hard, No. 3	12.15	11.10	9.15
Hard, No. 4	12.25	11.20	9.30
Pea	10.40	9.31	8.30
Buckwheat	8.60	8.60	6.70
Lykens Valley, No. 2	12.60	11.55	9.65
Lykens, Valley, No. 3	13.00	11.95	9.90

Deep down in the hearts of the coal men here there is probably little regret that 1918, a year of constant uncertainty, is gone. The retailer had his problems and at times feared that Government regulation would put him out of the running or seriously interfere with his earnings; the jobber had to veritably fight for life at times, but came out triumphant; the operator had so many problems that his troubles were truly legion.

Denmark's Coal Supply

Denmark's fuel problem, states Erwin W. Thompson, United States commercial attaché at Copenhagen, in a recent report, was quite satisfactorily solved during the first four years of the war by a recourse to wood and peat, aided by the well-organized and quick work of Denmark's coal distribution committees. At the beginning of the fifth year of war, says Mr. Thompson, this coal question should be considered again, the more so as the conditions for production and the political conditions abroad do not give Denmark any bright prospects of a good supply for the coming months.

It early became evident, continues the report, that the coal question would be a most difficult one for the entente. In September a London paper said that the coal problem in England was serious. In the beginning of October the British coal controller stated that even if peace came soon, the coal problem would not nearly be solved. England lives from hand to mouth with regard to coal. The supplies are very small, and the military demands are swallowing a great part of them. France is at present consuming 6,000,000 tons more than the normal annual rate, and Italy's demands are very heavy.

It will therefore be understood that the decreased production is keenly felt at home. In the first half of 1918 the production in the United Kingdom was 117,000,000 tons compared with 127,000,000 tons in the first half of 1917 and 140,000,000 tons in the first half of 1914.

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Six Men Rescued by Breathing Apparatus

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SYNOPSIS—*The fire in the Mt. Braddock mine on Jan. 20 was caused by the caving of the mine roof under a burning slate pile. Fortunately only six men were in the workings at the time. The air was reversed and all the men rescued. Some were in air of breathable, though questionable, quality, but had to be brought out in breathing apparatus because they had to be hauled in a trip through a zone of vitiated return air. Earlier in the day two men with no apparatus, finding that a rabbit was able to breathe the mine air for 20 minutes and live, went into the mine on a car trip. Evidently the rabbit was too slow in succumbing to the impure air to be a safe indicator, and the men stayed in the mine too long and were drawn out dead. The successful rescue men were seven hours in the mine while four of the rescued had been detained underground 24 hours.*

WHAT is probably the most successful and interesting piece of rescue work, and one which demonstrates the utility of the self-contained breathing apparatus, occurred on Jan. 20 at the Mt. Braddock mine of the W. J. Rainey Co., Mt. Braddock, Fayette County, Penn., where six men were recovered alive by the aid of breathing apparatus.

On the morning of Jan. 20 the firebosses at this mine discovered indications of smoke in the return airway, and no men were allowed to enter the mine except six who went to start the pumps and locate the fire. The fire was later discovered by another party, which found that it was located near the outcrop just to the right of the main slope and the air course. The ground beneath a burning slate dump had caved in and the burning material in the dump had ignited the coal pillars.

As may be assumed from what has been already said, the mine is approached by a slope. The active workings are about 1¾ miles from the mine mouth. The main haulage slope is paralleled by the manway, and both the slope and the manway were used for the return of the mine air. The fire was on the intake airway, and consequently the gases generated were all carried through the mine. The Rainey company's officials made heroic efforts to get to the fire and were making headway when the smoke forced them out; most of them were partially overcome by carbon monoxide.

The rescue teams of the companies working adjoining mines were called upon but owing to the condition of the roads their arrival was delayed. Three men from the Orient Central Rescue Station arrived early in the afternoon with breathing apparatus, which they quickly assembled. They entered the mine by way of the main slope and traveled down it about 4000 ft. to the main parting, encountering much smoke.

There they found two men, one unconscious and the other conscious. These men had found a leak in a compressed-air line and had enough presence of mind to remain at that point. The conscious man told the rescue team to give the signal to lower a trip, which was done, and the two men were loaded on the trip by the rescue team; all were hoisted quickly to the surface.

The recovered men were unconscious when they reached the slope mouth and were taken in hand by John S. Struble, inspector for the H. C. Frick Coke Co., who had just arrived with his rescue team. Eventually, by means of artificial respiration and oxygen they were revived. Struble then took charge of the work and the recovery of the other four men later was due largely to his good judgment and untiring efforts.

After looking over the map he decided to change the ventilation and prevent the gases from the fire getting to the section of the mine where the other four men were supposed to be located. His rescue crew, equipped with breathing apparatus, constructed a temporary brattice, a more permanent stopping being then constructed by men without apparatus. Apparatus men remained nearby while the permanent stopping was being constructed, so that they could aid the workmen if help were needed.

Bureau of Mines Rescue Car Arrives

Mean time the United States Bureau of Mines at Pittsburgh had been notified, and five men in a rescue truck left for the scene of the accident 20 minutes after word was received. They made record time until they struck a mud road about five miles from the mine. There the truck became mired. The crew was picked up by Stephen Arkwright, inspector for the H. C. Frick Coke Co., and J. T. Ryan, of the Mine Safety Appliances Co., of Pittsburgh, who were on their way to the mine in another car. They arrived about the time Struble had completed the brattices, the purpose of which was to direct fresh air through an overcast to the left side of the mine.

An organization was then perfected to take charge of the outside, and Struble, Arkwright and D. J. Parker organized an exploration party of ten men equipped with breathing apparatus, safety and electric lamps, and a canary. They entered the mine, following the direction of the intake as newly established. In following the fresh air they were required to travel a circuitous route where the going was bad, but they proceeded carefully and marked the route thoroughly with chalk in case they had to return the same way; finally, after 2½ hours of travel, they came to the main haulage slope immediately below the main parting.

Before the party proceeded through the door which separated the intake and return, two of the men went ahead and examined the return air with safety lamps and the canary. The air in the return at this point being clear, the party went through the door to the slope and located a telephone and made a report to the outside. After taking a rest they proceeded down the left slope, at which point was a pump. It was thought

that two of the men would be found there. After going about 600 ft. they saw a light 400 ft. ahead, apparently in the hands of a staggering man.

They approached it cautiously and found Charley Lerch, who fell to the ground just as they reached him. He was given oxygen from one of the breathing apparatus and quickly revived. He was able to tell that his "buddy" was back somewhere along the slope and unconscious. Arkwright, McCaa and Ryan took him back to the firebosses' shanty at the parting and gave him stimulant and oxygen, which brought him around in good shape.

Others of the party then proceeded down the slope and found Elmer Matthews about 3000 ft. from the parting, or about 2000 ft. beyond the first man recovered. By dint of hard work they revived him with artificial respiration and oxygen, but he was unable to walk and had to be carried back to the parting, where he readily responded to first-aid treatment. These men were unable to give any information as to the location of the other two men, so after a conference it was decided that these men were evidently in the vicinity of the other two pumps, which were located at the bottom of the right-hand slope.

Arkwright, Parker and Ryan, with five men equipped with apparatus, proceeded down the right-hand slope to explore for the other two men, leaving the other members of the rescue party to look after the two just recovered. The latter party communicated with the surface and had a trip sent down with blankets, stretchers, hot coffee and other stimulants. Arkwright's party located the two pumps, but found no trace of the men other than a safety lamp.

After exploring all the working places, they started out along the manway and found James Russell, who was partially conscious and quickly responded after oxygen was given him. He had no idea of where he was or how long he had been there and could give no information about his companion. Two of the party remained with him, and the others continued up the manway and found Frank Largon about 300 ft. beyond.

He was in bad condition, and in consequence he did not respond to treatment for almost a half hour. While three of the party worked on him, the others returned to the main parting for stretchers and assistance, upon the arrival of which the two men were carried out to the parting and were given stimulants and plenty of oxygen.

Did Not Want to Be Resuscitated

Largon had made up his mind that he was going to die, and he apparently did not want to change his fate. He refused to breathe oxygen, and at one time the whole party was working on him, rubbing him, holding safety lamps around him to keep him warm, meanwhile trying to get him to take stimulants and oxygen. He finally wanted to fight Struble, and the anticipation of this pleasure was sufficient inducement for him to decide to get well.

Now came the problem of getting these four men to the surface, a distance of 4000 ft. The most direct route was by way of the slope. It was plainly evident that on account of falls, partially closed passages and the exhausted condition of the rescued men, it would be impossible to carry the rescued back over the route the rescue party had traveled on entering. The rescuers were also confronted by the fact that, while the air was good on the slope at this point, about halfway up the slope the return from the fire section joined the return on the haulage slope.

To determine the condition of the air it was decided to send a canary and some safety lamps to the surface on a car trip. This plan was communicated to the outside to Mr. Sincocks, general superintendent of the W. J. Rainey Co., who had been overcome earlier in the day, but who was again back on the job. As soon as the trip reached the surface Sincocks examined the canary and found it had been overcome, and the safety lamps had been extinguished.

This information was communicated to the party underground, and after a conference it was decided to have additional rescue apparatus sent down for the four recovered men and for those whose oxygen was partially exhausted. It was also decided that a fresh canary and additional safety lamps should be sent in so that the condition of the air could be tested again when necessary. Fortunately there was plenty of equipment on hand, as additional apparatus had arrived from the Orient Central Rescue Station, and Rescue Car No. 6 of the United States Bureau of Mines had just arrived from Houtzdale, Penn.

Rescued and Rescuers Prepare to Leave Mine

The foregoing program was quickly carried out. When the trip arrived at the parting the canary had been overcome, but the safety lamps were still burning. The four rescued men were then seated comfortably in separate cars. Apparatus was adjusted on them, and two of the rescue crew were assigned to each car in which the men were placed. All the apparatus were tested carefully, and after eleven of the party were in their places, McCaa and Zorn examined each apparatus and turned on the oxygen, then examined one another's apparatus and got aboard.

Struble, at the telephone, gave instructions to hoist in two minutes. (Those two minutes seemed like an hour.) The trip started, and in 10 minutes the fourteen men, all wearing breathing apparatus, reached the surface in fine shape. They emerged from the mine at 8.10 a.m., Jan. 21. The four rescued men had been underground just 24 hours, and the rescuers seven hours, having entered the mine about 1 a. m.

The rescue crew was composed of the following men: Stephen Arkwright, inspector, H. C. Frick Coke Co.; John Struble, inspector, H. C. Frick Coke Co.; D. J. Parker, mine safety engineer, United States Bureau of Mines; Bert Dwyer, George McCaa and E. D. Gardner, mining engineers, United States Bureau of Mines; J. H. Zorn, rescue foreman, U. S. Bureau of Mines; J. T. Ryan, Mine Safety Appliances Co., Pittsburgh, Penn.; E. N. Barrett, H. C. Frick Coke Co., Footedale Rescue Team; S. J. Cornisky, H. C. Frick Coke Co., Leisenring Rescue Team.

The rescue crew from the Orient Central Rescue Station, who rescued the first two men, was composed of Mike Sopchick, Frank Krum and August Klause, and was under the direction of Charles Opperman, who is superintendent of the Orient station. These men had received training under the Bureau of Mines only the previous week, and they deserve credit for their heroic and successful work in face of great personal danger.

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Largon had made up his mind that he was going to die, and he apparently did not want to change his fate. He refused to breathe oxygen, and at one time the whole party was working on him, rubbing him, holding safety lamps around him to keep him warm, meanwhile trying to get him to take stimulants and oxygen. He finally wanted to fight Struble, and the anticipation of this pleasure was sufficient inducement for him to decide to get well.

Now came the problem of getting these four men to the surface, a distance of 4000 ft. The most direct route was by way of the slope. It was plainly evident that on account of falls, partially closed passages and the exhausted condition of the rescued men, it would be impossible to carry the rescued back over the route the rescue party had traveled on entering. The rescuers were also confronted by the fact that, while the air was good on the slope at this point, about halfway up the slope the return from the fire section joined the return on the haulage slope.

To determine the condition of the air it was decided to send a canary and some safety lamps to the surface on a car trip. This plan was communicated to the outside to Mr. Sincocks, general superintendent of the W. J. Rainey Co., who had been overcome earlier in the day, but who was again back on the job. As soon as the trip reached the surface Sincocks examined the canary and found it had been overcome, and the safety lamps had been extinguished.

This information was communicated to the party underground, and after a conference it was decided to have additional rescue apparatus sent down for the four recovered men and for those whose oxygen was partially exhausted. It was also decided that a fresh canary and additional safety lamps should be sent in so that the condition of the air could be tested again when necessary. Fortunately there was plenty of equipment on hand, as additional apparatus had arrived from the Orient Central Rescue Station, and Rescue Car No. 6 of the United States Bureau of Mines had just arrived from Houtzdale, Penn.

Rescued and Rescuers Prepare to Leave Mine

The foregoing program was quickly carried out. When the trip arrived at the parting the canary had been overcome, but the safety lamps were still burning. The four rescued men were then seated comfortably in separate cars. Apparatus was adjusted on them, and two of the rescue crew were assigned to each car in which the men were placed. All the apparatus were tested carefully, and after eleven of the party were in their places, McCaa and Zorn examined each apparatus and turned on the oxygen, then examined one another's apparatus and got aboard.

Struble, at the telephone, gave instructions to hoist in two minutes. (Those two minutes seemed like an hour.) The trip started, and in 10 minutes the fourteen men, all wearing breathing apparatus, reached the surface in fine shape. They emerged from the mine at 8.10 a.m., Jan. 21. The four rescued men had been underground just 24 hours, and the rescuers seven hours, having entered the mine about 1 a. m.

The rescue crew was composed of the following men: Stephen Arkwright, inspector, H. C. Frick Coke Co.; John Struble, inspector, H. C. Frick Coke Co.; D. J. Parker, mine safety engineer, United States Bureau of Mines; Bert Dwyer, George McCaa and E. D. Gardner, mining engineers, United States Bureau of Mines; J. H. Zorn, rescue foreman, U. S. Bureau of Mines; J. T. Ryan, Mine Safety Appliances Co., Pittsburgh, Penn.; E. N. Barrett, H. C. Frick Coke Co., Footedale Rescue Team; S. J. Cornisky, H. C. Frick Coke Co., Leisenring Rescue Team.

The rescue crew from the Orient Central Rescue Station, who rescued the first two men, was composed of Mike Sopchick, Frank Krum and August Klause, and was under the direction of Charles Opperman, who is superintendent of the Orient station. These men had received training under the Bureau of Mines only the previous week, and they deserve credit for their heroic and successful work in face of great personal danger.

The one unfortunate incident in connection with this accident was that during the morning of Jan. 20 two men attempted to enter the mine without breathing apparatus. They were let down the slope on a trip of cars and when hauled out 15 minutes later were dead.

It appears that prior to their entering the mine a rabbit (in the absence of a canary) had been sent down on a trip and when withdrawn some 20 minutes later was found to be all right. These incidents forcibly impress the fact that a canary is the only dependable medium for detecting carbon monoxide, and also that men should not do exploratory work about mine fires unless equipped with self-contained breathing apparatus or a canary, preferably both.

The work of the rescue parties who recovered the six live men demonstrated what can be done with self-contained breathing apparatus when in the hands of experienced mining men who are also thoroughly trained and familiar with the apparatus.

All the members of the rescue party that recovered the last four men were equipped with breathing apparatus, but in their underground explorations they were able to travel about 24,000 ft. in fresh air without having to use that equipment. When the four men were found an unusual situation had to be met, for, while the air was breathable in the remote workings where the men were located, there was yet such a quantity of carbon monoxide on the main slope that the canary sent out by the rescue party was killed in the short space of time (10 minutes) in which the trip was hauled up the slope. For this reason it was necessary to put breathing apparatus on the rescued men to get them to the surface.

Orient Central Rescue Station the Result of Operators' Cooperation

By L. U. Leslie
Uniontown, Penn.

Fifteen coal and coke companies in the Connellsville region recently united in the establishment of a central mine-rescue station with teams numbering 200 men. These men are responsible for the safety of 8000 miners employed at the operations. A two-story brick building has been constructed and equipped with mine-rescue apparatus, and the station is in permanent charge of Charles Opperman, Jr., in the capacity of captain. Mr. Opperman holds state certificates for both first-aid and mine-rescue work.

The establishment of this central mine-rescue station is held to be a substantial step forward in the advancement of safety in the coal mines. It places under unified control an important phase of coal mining and permits speedy mobilization of the relief facilities of all the companies interested within a short time in case of disaster. The station is equipped with a heavy motor truck, which, carrying full equipment, is capable of reaching any mine belonging to any member of the organization within a half hour after the receipt of a call for help.

Captain Opperman is located permanently at the rescue station. He is charged with the responsibility of keeping the equipment of the station available for immediate use; in addition, he is instructor in mine-rescue and first-aid methods. Mine-rescue teams have been organized for some time at the various operations, but the new plan places all teams under the command of Captain Opperman. He is now giving instructions to teams from the various operations. These teams are composed of from 5 to 10 men each and are required to report regularly for instruction and drill. At the expiration of their training the men will take examinations, and those who show that they have mastered the principles of their work will be given certificates.

Although the organization is complete and the work of instruction already started, other operations in the region are not excluded from participating in the benefits of the mine-rescue station. The trustees and executive management of the station stand ready at any time to receive the application of other operators in the region for admission into the united mine-rescue organization. Operations now included in the mine-rescue organization are the Orient Co., the Fayette Coke Co., the Uniontown-Connellsville Coke Co., the Tower Hill-Connellsville Coke Co., the Thompson-Connellsville Coke Co., the Struthers Coal and Coke Co., the Connellsville Central Coal and Coke Co., the Brier Hill Coke Co., the Taylor Coal and Coke Co., the Crucible Fuel Co., the Consolidated Coke Co., the Puritan Coke Co., and the Lincoln Coal and Coke Company.

Material advantages leading to reduced rates for workmen's compensation premiums were one of the leading factors in the organization and establishment of this mine-rescue station, but the operators were also moved by a desire to surround their men with all possible safeguards against accident. The knowledge that a competent relief organization is at all times ready to respond to a call for aid has already served to improve the spirit of the miners. Their interest has also increased in mine-rescue and safety methods.

The building in which the rescue station has its headquarters is erected at Orient, the mining town of the Orient Coke Co., and is known as the Orient central rescue station. The other operations in the organization are in close proximity to the headquarters, in what is known as the Republic district of the region.

The apparatus is housed in a specially constructed two-story brick building the plans and specifications for which were approved by the Bureau of Mines. The building has been inspected and sanctioned by the state insurance board. It is equipped with ten sets of Fleuss-Proto mine-rescue apparatus and all necessary supplies.

Pittsburgh to Receive More Power

Carl W. Schleuderberg, of the Westinghouse Electric and Manufacturing Co., declared at a recent local meeting of the American Electrochemical Society, held at Pittsburgh, Penn., that some large interests were planning for the construction of huge electric plants both at the mines and near available water power. These plants would develop some 700,000 kw. It is expected that the plants thus established may be able to produce current at prices as low as those established for Niagara or any other power in the country. This will be done though there exists at no point a source of power like that at Niagara Falls, which produces about 500,000 horsepower.

Who's Who in Coal Mining

THERE is a dynamic young man down in West Virginia who is carving an important niche for himself in the coal industry's hall of fame. His name is Walter H. Cunningham, and besides acting as secretary of the West Virginia Coal Association he finds time to serve as the secretary-treasurer of six independent coal companies and still do a lot of professional work as a consulting engineer.

Some men are just successful; nobody knows exactly why. Others stumble blindly into the doorway of opportunity and manage to forge ahead without showing evidences of great virtues. A few men are downright lucky and land on a road where the traveling is comparatively easy. But the case of Walter Cunningham forms no parallel with the foregoing examples. That he has succeeded in a gratifying fashion for a man so young cannot be doubted. That he has gained the honest respect of his West Virginia and Kentucky associates in the mining game is likewise true beyond peradventure. It is further a fact that his climb to a position of importance has come without assistance or pull.

WALTER H. CUNNINGHAM

In such a man there are always certain qualities that stand forth prominently and form the foundation of his individual success. So it is with Cunningham. His prime virtues are optimism and imagination. The first creates in him a cheerfulness that is contagious and that surrounds him with a host of friends. The second gives him an outlook on life that extends far beyond the boundaries of conventional engineering practice.

Most technically trained men are so matter-of-fact that their natural enthusiasm with reference to the average industrial project has been entirely subdued, if not wholly eliminated. Mr. Cunningham is no less a conscientious and careful engineer because of his ability to see possibilities that are yet in the making.

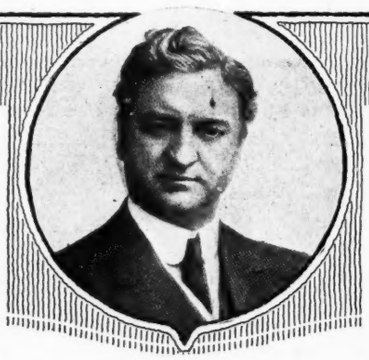
Difficulties cause no despair in his heart, for they are always met with hope. He is ever cheerful because he has beliefs—belief in friendship and belief in all the decent things that go to make living worth while. Walter Cunningham's smiling countenance provides him with a key that opens all doors. Those who meet him are impressed with the thought that he must be successful in order to be so happy. This fact inspires confidence and smooths roads that would be rough traveling to the fellow having less buoyancy. The kind of cheerfulness possessed by the young secretary of the West Virginia Coal Association is the type that has excellent wearing qualities. For this outstanding virtue was clearly in evidence back in 1899, when young Cunningham entered Lehigh University, filled with an ambition to become a great mining engineer. He is today a living proof of the idea that a happy disposition and a whole-hearted cordiality are the very best tonics for the mental and physical constitution of a man. While many virtues defer the day of recompense, the spirit of cheerfulness pays cash down.

Not yet 40 years of age, his life has been a busy one ever since those vacation days when as a youngster he earned his first dollars working in and around the mines in Pennsylvania. His earliest important work was with the Davis Coal and Coke Co., in 1906, as a mining engineer in Maryland and West Virginia. Leaving this company, he moved to Kentucky, where he served first as a manager of mines and later as general manager of a corporation producing a large annual tonnage of coal. This varied career has given him an understanding of mining, both from the viewpoint of the engineer and of the operator. It is for this reason, as well as his famous smile, that he has formed connections with many coal companies, and that his services have been in such wide demand for advice along expert lines.

Walter Cunningham is not the kind of man who can never see a cloud, but rather the sort of fellow who can see both the cloud and its silver lining. He has attacked life strenuously and has perfected the art of laying all emphasis, not on what has happened, but on the ends and aims that lie ahead. If he has served his chosen industry with greater credit than the average man, it is because he has founded his philosophy of life on the sound logic that no calamity is ever insurmountable; no sky is ever so bleak but somewhere, sometime, the sunshine will break through.

The Coal Industry of France

By ARTHUR J. BALDWIN, Vice President McGraw-Hill Co., Inc.



I HAVE seen Lens — the center of the great coal industry of northern France. Through the courtesy of the British General Staff, and as a guest of the British Ministry of Information, I was taken over the battlefields where Lens once stood. Lens is the name of the city that is the center of the great coal-producing region which bears that name. In this district before the war were numerous villages and towns where the miners who worked in the collieries were housed. Approximately 180,000 people inhabited the region. They are all gone. Their homes are gone. The mines where they used to work are utterly destroyed.

Germany seized these coal fields on her initial drive in 1914. The conflicting armies knew well the value of these fields, and a mighty struggle took place for the possession of the mines. German soldiers were billeted in the cellars. German artillery was hidden in the towns. German pill-boxes of solid concrete were constructed in some of the homes to repel the infantry attacks. This made the houses and towns a target for the British artillery.

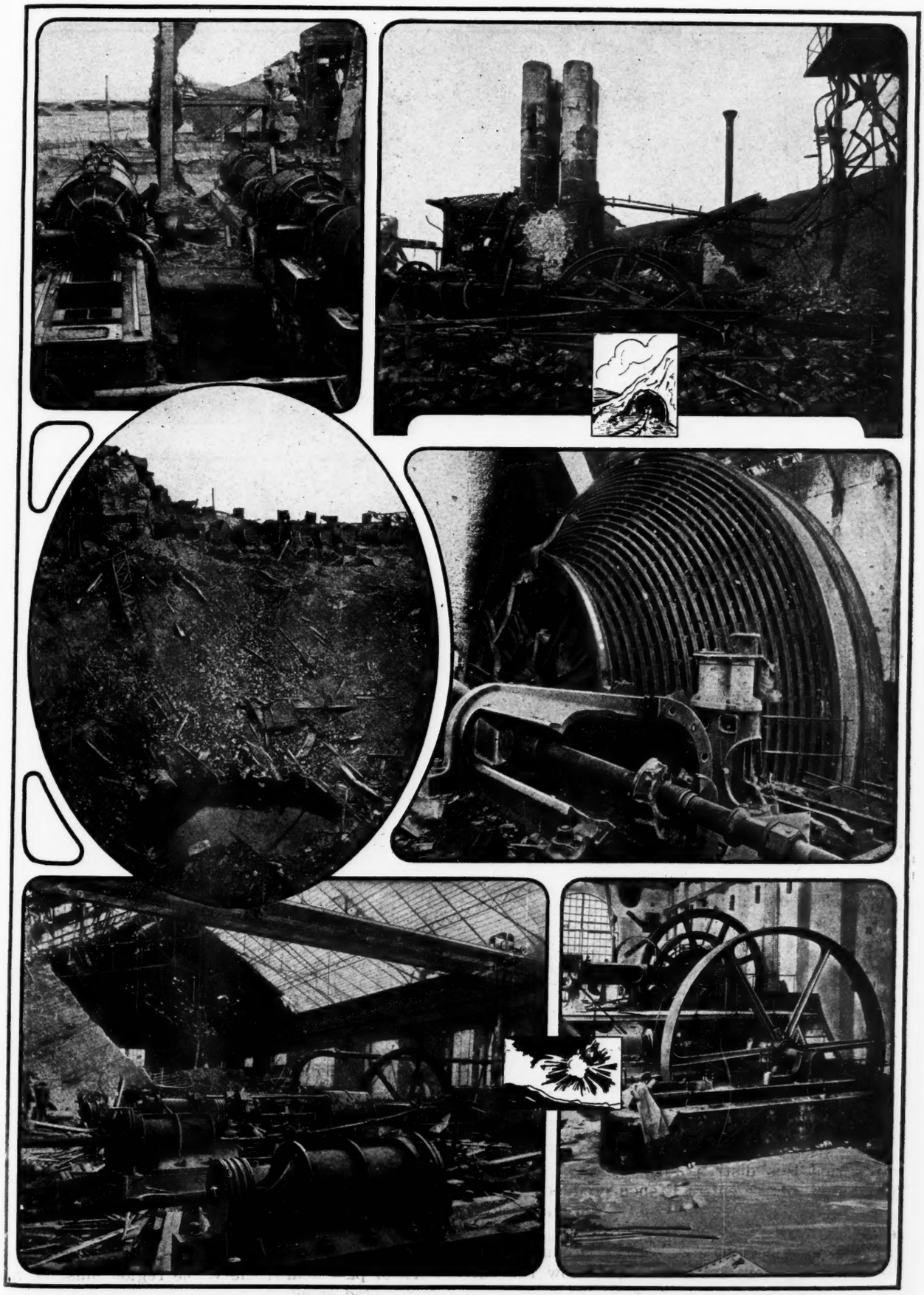
And so since 1914 there has been almost a constant rain of shells of all caliber, until the whole region is devastated, and nothing remains but masses of ruins. What the artillery did not destroy well-planned German mines accomplished. The shafts were blown up, underground workings destroyed, and water was diverted so that the mines were flooded.

Nearly all of the coal produced in France is bituminous of a good quality. France has little anthracite and is also short of coals for making gas and coke. The coal fields of France have a total area of nearly 1200 square miles. The territory, or rather the coal basin in which Lens is located, is from 5 to 10 miles wide and covers an area of more than 400 square miles. In the pre-war period this district furnished approximately 70 per cent. of the entire French production. The Lens region also was the chief byproduct coking center.

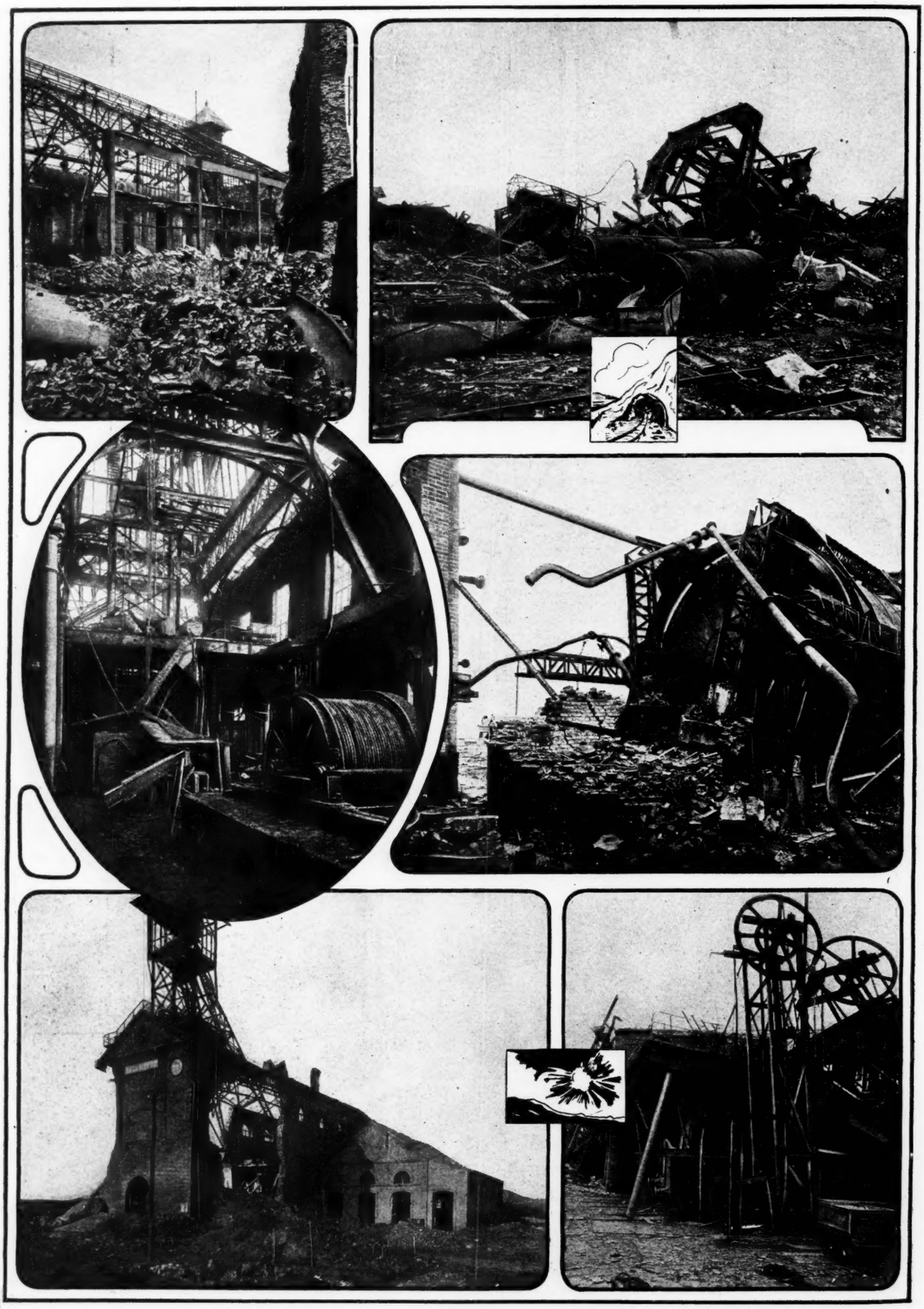
The greater part of the coal was produced from beds that lie more than 1000 ft. below the surface. A number of the shafts exceed 3000 ft. in depth. At many of the collieries 10 and even 12 separate and distinct seams of coal were worked. One of the beds in the vicinity of Lens averaged 23 ft. in thickness, while at a number of mines the seams were successfully worked when they did not exceed 18 to 20 in. in thickness. The output per individual employee in the French mines was never equal to the large production of the individual American miner. In 1913 the average production of each French coal miner was slightly more than one ton per day. Many problems occur in mining the French coal seams that are not common to American practice. The thinness of many of the beds makes it desirable to employ the long-wall system of mining. But even this plan of working is rendered difficult in places, due to the deep pitching of the coal. Many of the seams are overlaid by a weak shale roof, and safe mining is only carried on by the employment of an extensive and complicated system of timbering. At many collieries the roof is sustained through an elaborate system of flushing solid material into the worked-out sections of the seam. All main gangways and important entries are protected by brick or concrete masonry.

As is evident from the accompanying photographs, the surface construction is largely of steel. The power plants, washeries and tipples were modern in every respect, but the underground methods of mining as a general rule have not advanced rapidly in recent years. Nearly all of the mining is hand work, and it will be one worthwhile result if in the rehabilitation of the French collieries ancient practices are abandoned, and mining machines and other mechanical devices are introduced. Here lies hope for American manufacturers.

The question is asked—When will the mines again be opened? The difficulty is this: There are no railroads for transportation; there are no workmen; there are no places for housing the workmen. The people who left there have been scattered, and there is at present no incentive for them to return. There is nothing that can be salvaged from the work of past years; the whole region must be reconstructed anew.



"Shafts were blown up, underground workings destroyed, and the mines flooded"



"The whole Lens coal region is devastated, and nothing remains but masses of ruins"

"Nothing can be salvaged, the whole region must be reconstructed anew"

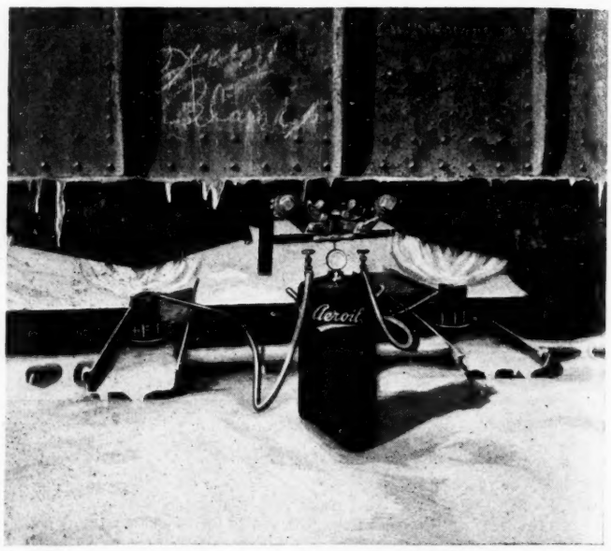
NEW APPARATUS AND EQUIPMENT

Kerosene Thawing Devices Serve a Number of Useful Purposes

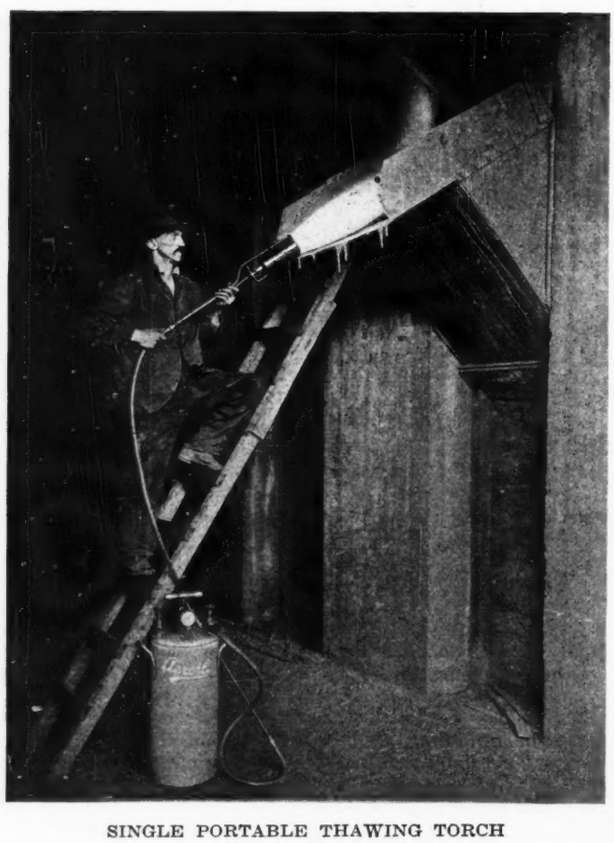
The Aeroil Coal-Thawing Outfits, Inc., of 1 Broadway, New York City, has recently placed on the market two thawing devices similar in purpose and principle of construction but varying in details of shape to suit convenience of application. The first of these is intended especially for thawing out cars filled with frozen coal. It consists of large twin blast torches, burning kerosene, built to direct their flames upward and drawing their fuel supply from a common pressure tank.

This outfit consists of a pressed steel tank of 10 gal. capacity provided with the necessary hand air pump, pressure gage, air and fuel regulating valves, hose, extension pipes and the two burners; also the necessary instructions. It is stated by the manufacturers that one man can easily operate six of these outfits and that each will thaw out a car of frozen coal in from 30 minutes to 2 hours, depending on weather conditions. Frozen car doors may be opened in about 10 minutes.

The second piece of apparatus is similar to the first except that it is smaller (5 gal. tank), has but one torch intended to be held in the hand, and is built for thawing out coal chutes, hoppers, gates and the like; also for melting ice on switches, ladders, etc., thawing out frozen air and water pipes, and for similar uses. It may also be used for brazing, welding and heating generally. This torch may be so manipulated as to be entirely safe and not detrimental to woodwork. Its use insures not only an efficient means of performing various thawing operations about the mine but entirely avoids the danger incident to wood fires arising from flying sparks or blowing coals.



TWIN TORCHES THAWING OUT A COAL CAR



SINGLE PORTABLE THAWING TORCH

Mine-Car Loader with a Bucket Conveyor for Scooping up the Mineral

The mine-car loader illustrated herewith is well adapted for certain mining conditions. It consists of three parts—the truck, scooping mechanism and the elevating conveyor. As will be seen, the motion of neither of the two moving parts last mentioned is reciprocating, but continuous. As there are two scoops making synchronous passage from the coal pile to the point of dumping and back to the coal pile, no time is lost. The travel of the buckets is so directed by sprockets that when a bucket is discharged it is promptly withdrawn clear of the hopper head.

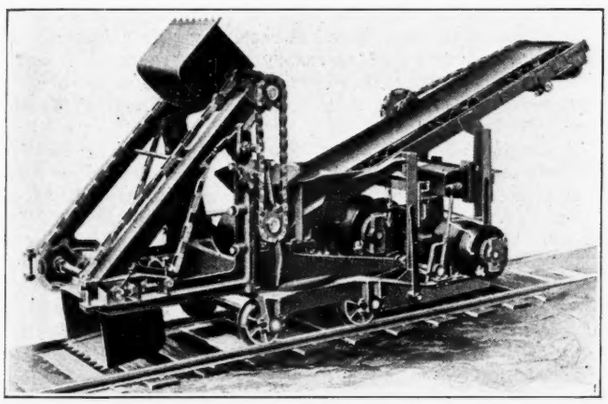
The scooping mechanism is so pivoted that it can dig to the side as well as in front of the machine. The material, however, on being delivered to the conveyor reaches the car behind the loader no matter at what angle the scoop may be working. The machine is self-propelled and so dimensioned that it can easily be moved around the mine. It will load at the rate of over a ton a minute and may be operated by unskilled labor.

While too high for thin seams, the over-all vertical dimension being 6 ft. 7½ in. with one bucket at the highest position and 5 ft. 6¾ in. with the buckets at mid positions, the whole equipment is compact, rigid

and durable. The three parts—truck, digging head and conveyor—can readily be dismounted and as readily reassembled. Thus the machine can easily be taken underground and moved from level to level.

The levers for operating the loader are located at one side and thus the operator is in full sight of the several movements. He has, however, nothing to do but keep the machine close up to the coal pile and swing the shovel from side to side of the roadway as needed. The loader is fitted with motors wound for 230 volts direct current, and these provide power for all operations. The motors are entirely inclosed, and all chains and gears are protected in use by suitable guards. The framework is of steel, the digging head is mounted on a large ball bearing, and all parts are protected as much as possible against dirt and water. All chains are provided with take-ups, and the digging edge of the bucket is filled with renewable tooth sections.

The maximum overall length is 15 ft. 9 in.; the track gage is small (only 24 in.), but that could readily be increased. The capacity of the machine is 1.75 tons per minute with full buckets, and the average capacity is 45 tons per hour. The weight of the complete machine is 4 tons.



VIEW OF McDERMOTT SHOVELING MACHINE

It is claimed for this machine that it eliminates the shovel idea. There are those that feel that the appropriate movement of a machine is not a backward and forward motion, but a continuous action. The first locomotives were to have feet which would push the carriage along the track, much as the bicycle in the early days was propelled by an occasional thrust of the foot. "What could we do better than imitate nature?" was the reflection of the earlier inventor.

The first idea of the flying man was to imitate the reciprocating wing movement of the birds, but continuous action is better suited to airplane machinery than any other, and the propeller works on that principle. The first idea of the steamboat designer was to propel oars reciprocally like an oarsman, but the rotary propeller, either a paddle-wheel or a screw, was finally thought to be the only solution of the problem. Only the continuously running flywheel saved the steam engine from comparative failure, and even today the steam turbine with its continuous action bids fair to put the reciprocating engine, despite its continuous-action parts, out of business. However, there are exceptions, and reciprocation, in the drill and the mining machine, the cage, elevator and steam shovel, still takes a highly successful place in the mechanical arts.

Other advantages claimed for this machine are that the material is not thrown onto the conveyor belt but is delivered to a hopper, and that the loader and car remain stationary during the digging and filling. Charles A. Lawrence, general superintendent of four iron mining companies in Michigan, whose address is Palatka, Mich., has been loading medium coarse iron ore with this shovel for 18 months, and he states that in two to four hours 75 to 100 tons can be handled by three men. In loading by handshovels a man will handle on an average about 15 tons per day. The shovel is manufactured by the Wellman-Seaver-Morgan Co., 7000 Central Ave., Cleveland, Ohio, and is known as the McDermott continuous twin-scoop loader.

Legal Department

INJURY THROUGH FALLING ROCK—In an action by a miner to recover damages for injury sustained through a fall of rock from the roof of an entry in defendant's mine, plaintiff's omission to make an inspection was no defense, in the absence of a showing that such inspection as he was required to make would have disclosed the defect resulting in the accident. And where a miner is required to remedy defects in the roof of a mine only when so directed by a superior, it is the operator's duty to furnish the means of obviating such defects as may be encountered. (Alabama Supreme Court, Dodd vs. Choctaw Coal and Mining Co., 79 Southern Reporter, 54.)

RIGHT TO ADVANCE PRICE—Prices were quoted on coal on the following stated condition: "All quotations are for immediate consideration; that is, subject to prior sale, also any advance as outlined by the Fuel Administrator and conditions generally existing in the coal fields over which we have no control." It is held by the New York Supreme Court, in the case of Carlisle vs. Lovell, 171 New York Supplement, 996, that orders for coal have been accepted by the sellers, the prices fixed by them could not be advanced to meet new prices fixed by the Fuel Administrator before delivery, although the new prices became effective before the selling jobbers placed orders at the mines to fill the particular contracts. No reason appears why the jobbers might not have presented the buyer's orders as soon as received, and thereby bound the owners at the mines by valid contract, which would have protected them in turn in the performance of their contract with their customer.

PRECAUTIONS AT ABANDONED SHAFTS—A section of the Oklahoma coal-mining laws declares: "In all mines where operations are temporarily or indefinitely suspended, the superintendent and mine foreman shall see that a danger signal be placed at the mine entrance which shall be a sufficient warning to persons not to enter the mine, and if ordinarily circulation of air through the mine be stopped, each entrance to said mine shall be securely fenced off and a danger signal shall be displayed upon said fence." Another section of the statutes makes a mine owner liable for injury sustained by another through violation of the quoted provision. In the recent case of Pinkston vs. Whitehead Coal Mining Co., 175 Pacific Reporter, 364, it is decided by the Oklahoma Supreme Court that the statute operates for the benefit of all persons on such mining premises, whether they be there with the consent or permission of the mine owner or not. And it is held that an operator may be held liable for death of a young man who descended into an unguarded shaft to recover a piece of jewelry dropped by a young woman companion, and who was suffocated by mine gases.

Anthracite Prices and Many Other Restrictions Suspended

Maximum prices on anthracite coal, together with all other coal and coke regulations except three, were suspended effective Feb. 1, in a blanket order issued on Jan. 31 by Fuel Administrator Garfield.

The only restrictions not suspended, as to coke and all coal, are: Those requiring that contracts be made subject to maximum prices if reinstated, subject to cancellation by the Fuel Administration and subject to requisition or diversion of coal by the Fuel Administration; those prohibiting reconsignments of coal; those requiring shipments of coal to tidewater to go through the Tidewater Coal Exchange. The tidewater and reconsignment regulations were retained at the request of the Railroad Administration, to avoid congestion of coal at tidewater, and the resultant embargoes.

The order includes the suspension of price and zone regulations on coke and bituminous coal which, it was announced Jan. 17, would be effective Feb. 1. As the Administration's control of the oil industry already has been suspended with the exception of certain natural gas regulations, the effect of the order of Jan. 31 was said to be that the Fuel Administration's controls are now relaxed to the present limit of safety, pending the proclamation of peace, when the Administration automatically will terminate.

It was pointed out that as the responsibilities of the Fuel Administration under the Lever Act continue as long as a state of war officially exists, any of these suspended regulations may be reinstated or others may be put into effect should occasion arise. An instance of the continuing activities of the Administration was found in its Bureau of Labor, which will function actively during the armistice. Any dispute failing in settlement between the parties at interest must be submitted as heretofore to the Fuel Administration for final disposition without stoppage of work.

The following statement was issued:

By his Executive Order of Aug. 23, 1917, the President adopted as maximum prices for anthracite coal the schedule of prices which had been acquiesced in by the industry while under investigation by the Federal Trade Commission under the so-called "Calder" resolution of the Senate. This involved one price for the railroad controlled coal companies and a price 75c. higher for the individuals. With the exception of a reduction of 60c. a ton in the prices for pea coal made Oct. 1, 1917, and two adjustments to cover increases in miners' wages, the Fuel Administration allowed the prices fixed by the president to stand pending examination of costs such as were made in the case of bituminous coal.

For the purpose of arriving at a fair increase in price to cover the increase in wages recommended by the War Labor Board last October, an examination was made to determine the costs of the various anthracite producing companies. The result of this examination showed that the general increases in the price of materials and labor had raised the cost of mining anthracite to such an extent that many of the companies were not receiving a fair return and that some producers of necessary coal were actually sustaining a loss on the sale of coal at the Government prices, in spite of the two increases allowed on account of advances to labor.

At the time this situation was discovered every indication pointed to an early peace and it was deemed unwise to increase the maximum prices so near the time when, on account of the end of the war, price restrictions would in the natural course of events be lifted entirely.

The foregoing statement is made at this time, when price restrictions are about to be lifted, out of fairness to those companies who have patriotically kept up their production to war needs, even at a cost which resulted in many instances in a loss, not only by the individuals, but also by some of the railroad companies, so that the impression shall not exist that the Government prices of anthracite coal in existence at the time of the lifting of restrictions were prices which the Fuel Administration had fixed on the basis of cost to the operators.

Had the Fuel Administration's active control over maximum prices on anthracite coal been continued, the cost examination above referred to shows that it would have been necessary, on the basis of the present wage scale, to raise these maximum prices possibly as much as 50c. a ton above those last fixed by the Government, in order to prevent financial embarassment and perhaps the closing of companies producing a substantial percentage of the necessary anthracite output.

Such a curtailment of production would eventually result in the demand exceeding the supply to such an extent as to increase the prices much higher than they would be if that supply were continued.

Examiner Reports Unfavorably in Western Kentucky Rate Controversy

A report unfavorable to the contention of the Ohio Valley Coal Operators' Association has been made to the Interstate Commerce Commission in the matter of rates from western Kentucky to various points in the Mississippi Valley and the Southwest. The examiner declares that evidence has not been produced showing that the rates complained of are unreasonable per se. He cites several instances, however, where the removal of prejudicial rates is desirable. The Commission may or may not follow the report made to it by the examiner.

Anthracite Committee of Fuel Administration Goes Out of Existence

The Anthracite Committee of the United States Fuel Administration, which has had direct control over the distribution of anthracite since its appointment last March, has gone out of existence in accord with the general order of Dr. Garfield relinquishing all price and other control over coal and coke. Communications regarding matters formerly handled by this committee should in future be addressed to the United States Fuel Administration, Washington, D. C.

Pooling of Railroad Equipment Resulted in Sufficient Car Supply

A total of 16,500,000 tons of coal was loaded into vessels at Hampton Roads between June 1 and Dec. 20, 1918. This is an increase of 1,500,000 tons in the amount of coal handled during the corresponding period of 1917. The regional director for the Pocahontas district is authority for the foregoing figures. In a report to the Director General of Railroads, he also makes the following statements:

To the common use or pooling of coal-carrying equipment and its distribution by central control and the pooling of coal at tidewater and at Lake Erie ports is attributed a practically uniformly sufficient car supply at coal mines, resulting in increased production.

Consolidation of coal-dumping facilities of the Norfolk & Western, Chesapeake & Ohio, and Virginian railroads at Hampton Roads, Va., together with pooling of coal by interested shippers under direction of the United States Fuel Administration, and shifting of vessels from one pier to another for loading under direction of the United States Shipping Board, made possible handling of a greatly increased coal tonnage for transshipment by water to New England, for bunker purposes, and for the Army and Navy and overseas, and materially lessened the delay to railroad cars awaiting dumping and delay to vessels awaiting berths at piers, under adverse shipping conditions.

During the last six months of this year nearly 400,000 tons of coal was transferred in cars from the rails of the Virginian R.R. after arrival at Norfolk, Va., to the rails of the Norfolk & Western R.R., and dumped over the Norfolk & Western piers, at a time when the facilities of the Virginian were inadequate to dump the coal as fast as it could be transported. This shifting of cars for dumping resulted in accelerated dispatch and was a factor in maintaining a free working supply of cars at the mines for reloading.

By arrangement with the United States Fuel Administration, certain tonnages of low volatile coal needed in the West were drawn more particularly from the Norfolk & Western R.R., and like tonnage turned east from the Chesapeake & Ohio R.R., reducing crosshauling on the Chesapeake & Ohio R.R., through yards where the movement was forcing in excess of facilities for handling.

The Norfolk & Western R.R., Columbus line; Chesapeake Columbus line, were used in common in moving western coal through Columbus and Cincinnati, Ohio, gateways from the mines of the Norfolk & Western and Chesapeake & Ohio, and in handling empties returning to mines through those gateways. This common use, together with the prompt receipt of loads by connections at Columbus and Cincinnati, which, being also operated in common, alternated in moving loads from the Chesapeake & Ohio and Norfolk & Western when offered and as necessary to keep traffic going forward currently, resulted in extraordinarily free movement of western coal traffic in very heavy volume.

Pending improvements on the Virginian R.R., to enable it to handle maximum tonnage of coal from mines for which it served as outlet, that road was relieved of handling traffic moving over its line overhead from connecting roads for destinations beyond the Virginian R.R. and such traffic taken over by the Norfolk & Western and Chesapeake & Ohio railroads.

Double service performed by Chesapeake & Ohio and Virginian railroads to coal mines served jointly by them was discontinued, and individual joint mines assigned to the Virginian or Chesapeake & Ohio respectively for single service, resulting in saving in fuel for engines, time of train and engine crews, and more efficient service.

The regional director for the eastern region lists the following as one of the greatest transportation achievements in his region:

The Lake coal and ore movement was followed vigorously throughout the year, and the volume of shipments offering were handled currently, with the result that there was a total of 29,388,242 tons of coal dumped at Lake ports prior to the close of navigation on the Great Lakes, or 917,963 tons in excess of 1917. The ore movement from the Lake ports for the season totaled 33,726,380 tons, which was 368,000 tons less than 1917; 1,622,000 tons less than 1916, and 6,343,000 tons in excess of 1915. The coal program was completed on Nov. 30, 1918, as compared with Dec. 12 in 1917, and the tonnage handled was the largest on record.

Gathering of Statistics on Coal and Coke May Have to Cease

Unless Congress will approve an appropriation of $40,000, asked by the Geological Survey, the coal industry will not continue to have the advantage of the special statistics which have been compiled by the Fuel Administration on coal and coke production and distribution. Owing to the increase from 5000 to 8000 in the number of coal mines, the Survey's appropriation is inadequate even for its regular coal statistical work. As Congress probably is not acquainted with the value that these statistics are to the coal industry, it is feared that the appropriation will not be allowed. In recommending the appropriation, the Secretary of the Interior said:

This appropriation is intended to provide for the continuance after June 30 next of the statistical work now conducted on an extensive scale by the Fuel Administration in coöperation with the Geological Survey of the Department of the Interior. The collection of the statistics of coal and coke production by the Geological Survey before the creation of the Fuel Administration in August, 1917, was necessarily largely and rapidly expanded to meet the fuel demands of the nation during the industrial crisis, and up to November last the work was on a scale of an annual expenditure of more than $400,000. Since then the demand for some of the classes of inquiries as to stocks of fuel, etc., has changed so that the extent of the work is now being rapidly reduced. Yet experience has shown to both the coal industry and the general public the real need of official information on the subject of coal production and distribution in the form of current statistics frequently collected and promptly issued by the Government, and it is the expressed desire of the Fuel Administrator that provision be made for the continuation of work on at least the reduced scale provided in the appropriation here recommended.

I regard as conservative the annual expenditure of $40,000 for thus keeping the public authoritatively informed as to the working condition of this nation-wide industry which represents a capital investment of more than one billion dollars for the bituminous coal mines alone, which altogether employs an industrial army of three-quarters of a million men, which furnishes not only the motive power for the railroads but one-third of the freight carried, and which represents the constantly changing development of the nation's largest mineral resource.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The termination of the world war seems from the indications in the newspapers to be drawing close. With it comes the end of our labor contracts. The fourth clause of the Washington agreement says: "Subject to the next biennial convention of the United Mine Workers of America, the Mine Workers' representatives agree that the present contract be extended during the continuation of the war and not to exceed two years from Apr. 1, 1918." So much for the bituminous region. In the anthracite region the contract will end at the same time.

Under those circumstances it seems the height of imprudence for the business concerns to reduce their stocks by using more bituminous coal than they buy. The Chicago & Alton R.R. in Illinois sees the matter in the right light. The Alton road on Jan. 16 gave orders that 50,000 tons of coal be stocked along certain of its abandoned tracks. The continued shortage of work is, however, showing the mine worker how the land really lies, and while some are only angered by the slack work and some are prone to say it must be met by increased pay for working days as a balance for those that are idle, some men are convinced that the mine worker will get all he can expect if he keeps his wages at the present level.

WAGE RATE ALREADY GRADUATED FOR SLOW TIME

In fact he should be quite content with that concession; for irregularity of employment is becoming quite general, and the mine worker must expect a little of it. Moreover, he may remember that his recent increase in pay was largely granted to satisfy him for the short time he was permitted to work. When he worked half time, he demanded enough to give him full-time pay. Almost immediately thereafter he got full time and his pay was not scaled back. Now he works short time he wants increased pay as a compensation for his irregular work. Like a man on an old fashioned mine engine he shifts from foot to foot, always rising with the step which is for the moment ascending. Now the short-time rod lifts him up. Then it is the steady-work rod boosts him a few feet. Again he chooses the short-time rod, seeing it is likely to help him upward. It would be all right if he were the only person in the world, but this constant climbing is at the cost of the working-man consumer.

HEIDELBERGERS WILL SUBMIT MINIMUM WAGE DEMAND

The strike at the Heidelberg collieries, Nos. 1 and 2, of the Lehigh Valley Coal Co. located at Dupont, Penn., came to an end on the evening of Jan. 27. The men are going to confer with the company through a committee. District President Yannis (District No. 1) advised the men to return to work and let the matter be settled in the appointed way. Further details about this strike which commenced Jan. 18 can be found on page 238 of this present volume. On Jan. 27, 1200 mine workers at Pine Colliery of the Delaware, Lackawanna & Western R.R. Co. Coal Department had a button strike.

United Mine Workers' officials say that at some of the collieries there has been trouble because men who filled two associated jobs during the war are no longer willing to do so, now that the scarcity of employees is decreased. Though one man could easily fill two positions they demand now that two men shall be employed.

In the Lehigh region the United Mine Workers of America have lost strength during the war. Before the war, there were 17,000 members and now only 13,000; the 4000 men who have left are said to be accounted for by the military draft and by migrations to munitions works.

The mine workers of the anthracite region are establishing coöperative stores such as are common in Illinois and Ohio. The Shenandoah mine workers appear to be taking a large part in starting the coöperative movement. On Jan. 29 a wholesale and retail store will be opened and more will follow later.

Anthracite mine workers have so anxiously sought wage increases and have used such unfortunate ways of securing them during the war that it is strange that they should begrudge meeting the increases in expense of the Lehigh Traction Co. of Hazleton by the payment of increased car fares. The mere penny a ride demanded did not hurt the mine workers' pocketbook, and it certainly was a measure of justice. At least, the Public Service Commission took that point of view and dismissed the complaints of two narrow-minded, reactionary locals which could not see that right was right regardless who the claimant might be that sought redress.

RUSSIANS WANT THEIR WAR-WORK MONEY BACK

In Ellsworth, Penn., it appears that a demobilized soldier who had secured a job with the Ellsworth Collieries Co. spread the report that the United War Work Fund was merely a fraudulent scheme for depriving the men of their money. The Ellsworth men, for the most part, are intelligent workmen, but there are a large number of Russians among them, and they believed all that was told them. A meeting was held by K. K. McClure of the Department of Justice, and 300 Russians by their cries broke up the assembly.

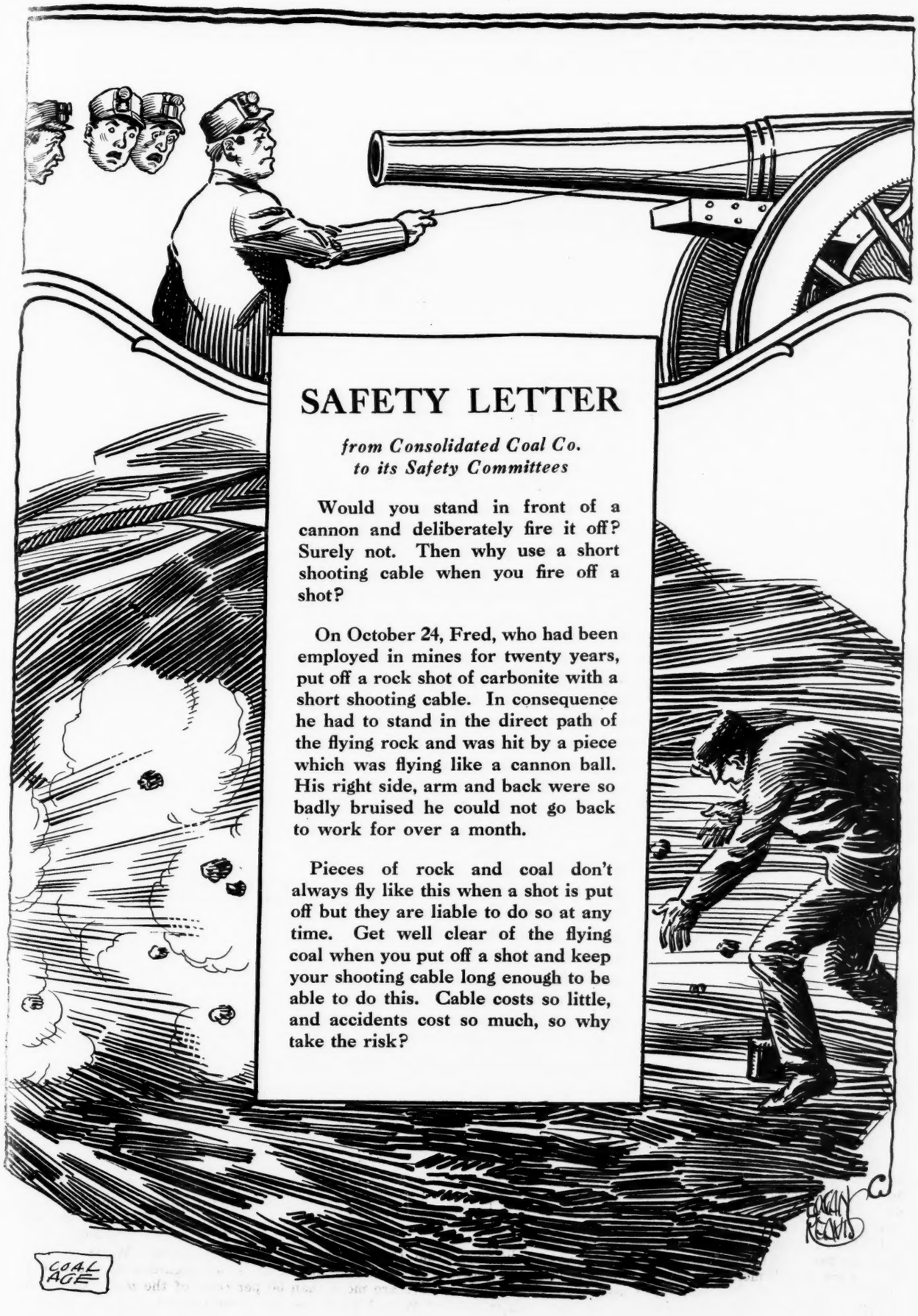
According to Government officials each miner agreed to give $4.75 to the fund. The company collected in all $7596.88, but gave no receipts for the money. This also was thought by the suspicious to be evidence of irregularity. It is said that the money was put in the bank to the credit of the Ellsworth company.

Union organizer Garvin tried hard to allay the agitation which he firmly believes to be in every way unjustified, but the Russians are not to be convinced by arguments when uttered in a language that they do not understand. Moreover, they seem bent on dragging Ellsworth down to the level of the towns in the Dombrova basin of Russia. The Ellsworth company is truly worthy of condolence. It has done more for its men than almost any other company in the United States. For many years it has extended a friendly hand to the union.

It is only just to the union to say that it has reciprocated, but some of the Ellsworth foreign mine workers—the old Believers of Russia—sometimes seem almost beyond the compulsions of kindliness and generosity. At other times the work of the company among these people seems to be meeting with great success, though nothing like that attained with the Slavs and Italians who seem more amenable to sympathetic guidance and who learn enough English to absorb American ideals. The company is willing to return the money collected to anyone who makes a demand for it.

WOULD LEGISLATE FOR WEIGHING OF ALL COAL

District No. 29 of the United Mine Workers has passed a resolution condemning the committee on Mines and Mining of the House of Delegates in West Virginia for its adverse report on a measure requiring all mines at which ten or more men were employed to pay the miners by weight and which also required that scales be installed and maintained at such mines. The records of the House do not show that the bill has been voted upon yet. While no definite figures are obtainable it is not regarded as probable that there are more than 50 per cent. of the mines of the state of West Virginia equipped with scales.



SAFETY LETTER

from Consolidated Coal Co.
to its Safety Committees

Would you stand in front of a cannon and deliberately fire it off? Surely not. Then why use a short shooting cable when you fire off a shot?

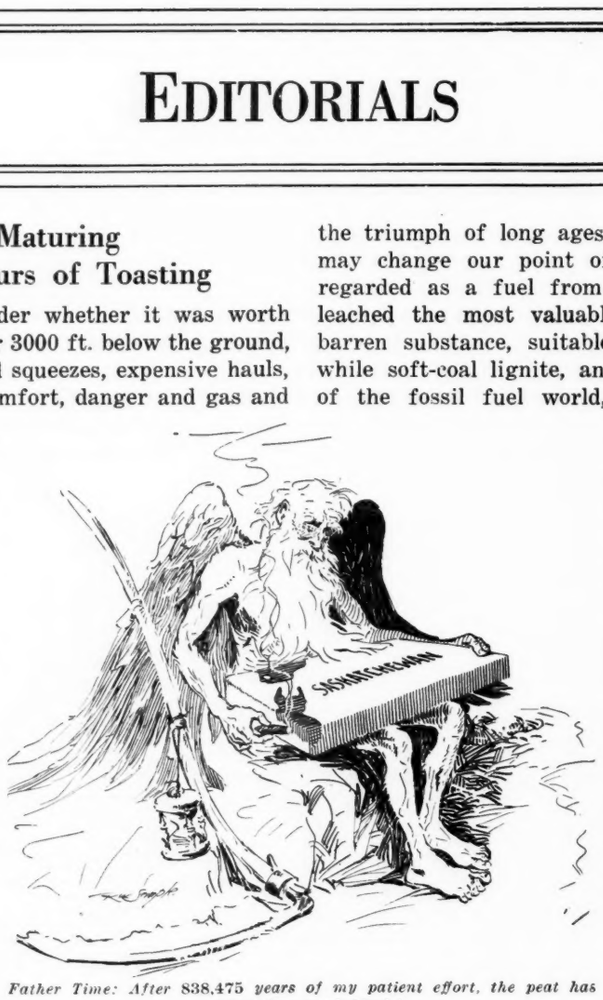
On October 24, Fred, who had been employed in mines for twenty years, put off a rock shot of carbonite with a short shooting cable. In consequence he had to stand in the direct path of the flying rock and was hit by a piece which was flying like a cannon ball. His right side, arm and back were so badly bruised he could not go back to work for over a month.

Pieces of rock and coal don't always fly like this when a shot is put off but they are liable to do so at any time. Get well clear of the flying coal when you put off a shot and keep your shooting cable long enough to be able to do this. Cable costs so little, and accidents cost so much, so why take the risk?

EDITORIALS

A Million Years of Maturing or Only a Few Hours of Toasting

SOME DAY we may wonder whether it was worth while chasing coal 2000 or 3000 ft. below the ground, with trouble from bumps and squeezes, expensive hauls, steep dips, deep shafts, discomfort, danger and gas and what not, when by some contriving, the nature of which is perhaps not wholly clear up to the present, we could have converted lignite into coal or acceptable coke by a few hours of judicious toasting and could have secured a large quantity of byproducts in the bargain. We cannot perform these wonders yet, but we surely will be able to do so later. Then we shall be able to strip the top off an extensive lignite bed and toast it into good coal, the counterpart of anthracite. The byproducts and the saving in freight rate will pay us royally for our pains, and we shall be saved all the wastes, expenses and dangers of deep mining. The lignites are for the most part found under light cover. Of course, they are in many, many instances only minable by underground methods, and in some cases they may be extremely deep. To such profundities they will not soon be followed, but they may be worked in shallow depths abundantly if only the toasting problem can be satisfactorily solved.



Father Time: After 838,475 years of my patient effort, the peat has at length turned black!

It is interesting to notice the condition in Western Canada. Only 6.71 per cent. of its actual reserves of coal are semi-anthracite or bituminous. The other 93.29 per cent. is lignite or lignitic (that is, sub-bituminous). The higher-grade coals are in the mountains and are rare. The lignites are on the lower levels and are well distributed. If by toasting them we can get the service of high-grade coal from them, we may find that Saskatchewan and eastern Alberta will be even greater rivals of the Canadian Rocky Mountain region than they are at present.

Even now these regions are healthy rivals. Our readers, we feel sure, will be surprised to learn from the pen of James White that in 1917 the lignite production of Alberta was greater than the combined bituminous and semi-anthracite production of the province, for the lignite mines produced 51.3 per cent. of the whole coal output of Alberta.

We look upon anthracite today as the super-coal, the triumph of long ages of toasting. Some day we may change our point of view. Anthracite will be regarded as a fuel from which time and heat have leached the most valuable of byproducts, leaving a barren substance, suitable only for burning. Meanwhile soft-coal lignite, and even peat, the Cinderellas of the fossil fuel world, will be regarded as substances of greater value. Instead of saying "only lignite," we may say "only anthracite," regarding the latter as the more senile, and less useful, product of the mineral world. The very scarcity of anthracite is making such a point of view likely, for we shall soon be obliged to make anthracite substitutes in large quantity. We shall carry the toasting to the exact degree we think advisable, and incidentally we shall learn how to derive all manner of profit from that partial distillation. If highly mineralized anthracite had been more general, better distributed and in larger quantity, it would have stood in the way of the development of the coal-distilling industry; in fact it might have prevented the manufacture of coke of all kinds, for anthracite is an excellent smelting fuel.

But anthracite, being remote from the points where it was needed, and being minable for the most part with difficulty, has permitted the development of the coke industry; and it will doubtless have also to permit the development of the toasted-coal industry. After all, the world has the virtues of its defects. If we had all the mineral wealth we desired along certain lines, we might fail to develop other minerals, such as soft coal and lignite, which may hold even greater possibilities before us. We may find in them not only things "just as good," but better.

Mudding Coal at St. Eloy, France

AN ARTICLE in the present issue describes the manner in which the badly crumpled bituminous coals of St. Eloy are filled with mud as a means of extinguishing fires. The reader will assume, and assume rightly, that a bed uncrumpled and not creviced would not take so kindly as the St. Eloy coal does to this process of fire extinction.

Apart from this crumpling, French coal seems to have a quality of its own. We could imagine a slow-burning

anthracite thus readily extinguished, but it is hard to conceive of a coal having 35 to 40 per cent. of volatile matter submitting thus tamely to such a slow and incomplete process of sealing. It shows that there is something yet for us to learn about coals and their ways.

Perhaps this coal tends to give out carbon dioxide rather than methane. Some of the French coals have that peculiarity. It is evident that a coal which at an extremely low heat gives off non-combustible gas will be easily extinguished, whereas one which gives off a combustible gas will refuse to succumb to treatment. The question comes whether slack would not be better than washery waste or ashes, for coal thus thoroughly impregnated with infinitesimal impurities must be almost ruined for market purposes. In places in the St. Eloy district the seams almost combine and reach together a thickness of 86 feet.

Of all times in history, the present is the one time when the mine official must saturate himself with sound economic doctrine. He must remember that the fundamental laws of economics are quite as important today as are the laws of ventilation, haulage or hoisting.

Byproducts of Labor-Union Activity

LABOR unions have grown considerably during the war. They have gained more and more the ability to get what they demand, subject only to economic law. Workers in one industry, say coal mining for instance, press for an increase. They get it, and the artisans in other industries pay it. Immediately the other industries become envious of the good luck of the men in the coal mines and later they begin to feel the effect of the appreciation in the monetary value of the coal they purchase. So they in turn demand increases.

The situation resembles nothing more closely than an old pantomime stunt, in which Clown has his sausages stolen by Harlequin, and Harlequin no sooner rejoices in his pelf than he is robbed by Columbine. Then Pantaloon and Scaramouch rob and are robbed in turn. The humor of it never failed to bring down the house. Just in the same way the workers of various industries pick the pockets of one another. By demanding higher wages they cause a continued increase in the cost of living, in which all lose what they have gained.

But this continued increase is, on the whole, favorable to business. Under its influence prices of goods do not decline, they rise. In consequence it is safer to buy goods or to construct buildings than to retain money. Hence, trade is steadily encouraged, and waiting for better times is an unprofitable undertaking.

Unjust as is inflation in many respects, the public thrives on it. Inflation is often one of the byproducts of extensive labor unionism. It is a splendid stimulant, but it must always be remembered that it should be used with caution. The worst Russian "jag" has been inflation, and not vodka. In that vast region everyone wants to buy and no one to sell. We want a little of the keenness to buy right here, while Russia would greatly like our keenness to sell. A little inflation is like a cup of coffee—a good beverage which, if taken moderately, will clear our minds of the inertia of the night.

Did Labor Profiteer During the War?

REPRESENTATIVE HUDDLESTON, of Alabama, on Jan. 21 addressed the House of Representatives in defense of labor. He declared that labor did not profiteer during the war, and with a delightful indifference to the fact that many men's wages rose immensely in 1918, submitted a table showing only the increases between December, 1914, and December, 1917. The table he quoted also left out all account of the increases of many classes of workingmen, notably the miners. Yet there are a number of these in Huddleston's district.

But taking Representative Huddleston's table just as it is, one cannot fail to conclude that certain laboring men did most grievously profiteer. Some gained 65 per cent. increases and others only 6 and 7 per cent. Some which the table does not mention probably got no increased wage. We are asked to absolve all labor because the average increases in the pay of labor did not exceed the increases in cost of living. But the argument seems to be that some men had less buying power at the end of 1917 and others had more. So evidently some workingmen did profiteer.

As a matter of fact labor as a whole can never profiteer. The wage of labor can never be any more than labor produces. There is therefore a limit to the real payment of labor, and that limit is set by production. If production increases, then the real payment of labor can be increased, and that without profiteering. If the production does not increase every increase on the face value of wages is either not a real increase of wages or it is profiteering. The increase is obtained at the expense of other workingmen. Every increase of wage puts up the cost of living. Every change in the rate of pay of any one class of operatives decreases the real earnings of every other class. The high wage of the sheet-metal workers, the loftsmen and electricians, to quote Huddleston's misleading table, reduced the real wages of the bricklayers and others.

By lifting themselves they dragged other workingmen down. Labor as a whole cannot profiteer. Certain trades can; individuals also can; but speaking in general, we cannot one and all profiteer on one another. Labor cannot profiteer as a whole any more than a man can raise himself by tugging on his shoulder straps. If labor by striking could increase its real returns without reducing thereby the returns of other labor, the strike would be so beneficial to the human race that labor agitators would deserve statues in the public squares. As it is, strikes are but attempts to exploit the workers in all other industries than the one which is striking, or are attempts to rectify the conditions of some industry at the expense of others.

The profiteering of labor cannot be disproved or excused by showing that labor as a whole did not profit by it. The profiteering was only the more to be condemned because all did not share in it; and, in fact, had other workingmen not been made the poorer by it, it would not have been profiteering. But it must be conceded that part of the increase was not profiteering at all, especially in 1917. It was a contribution to the workingman to induce him to leave his home and meet the cost of entering a new and often temporary industry in a new and often makeshift town. He was entitled to payment for it, no matter who had to provide it.

DISCUSSION BY READERS

Drawing Pillars in Machine Mining

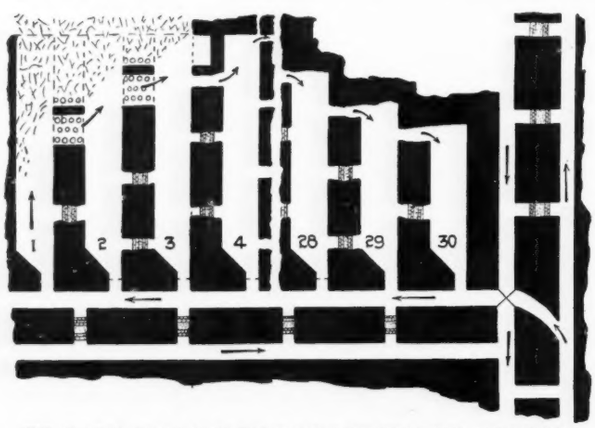
Letter No. 1—The inquiry of "Operator," regarding the drawing of ribs by machines, which appeared in *Coal Age*, Jan. 2, p. 32, was particularly interesting to me, inasmuch as the conditions with respect to the roof and height of coal are similar to those in our mines. We are using three types of machines, one of which is the same Sullivan shortwall machine stated as being employed by Operator.

The width of the rooms being given as 27 ft., I assume they are driven on 40-ft. centers, leaving pillars 12 or 13 ft. wide to be drawn. I would suggest, here, that better results can be obtained and greater safety secured by driving the rooms narrower, say 18 or 20 ft. wide, which would make the width of pillar 20 or 22 feet.

A machine will remove the supporting coal at the rate of about 15 to 18 sq.ft. per min., which is much faster than can possibly be done when using a pick. Moreover, in machine work there is not the same chance to set timbers for the support of the roof as in pick work.

In drawing back ribs, by machines, the cross-section of a 12-ft. pillar does not afford sufficient strength to break the rock, under 200 ft. of cover, when the first cut has been made with the machine. The consequence is that the weight of the roof rides over, crushing the narrow pillars and developing a squeeze or creep in the workings.

In the accompanying figure, I have attempted to show the general plan that we have adopted in our mine and



DRAWING PILLARS BY THE RETREATING METHOD

which has been found to work succesfully when drawing back the ribs by machines. The figure shows a section of the workings, on a pair of crossheadings driven to the left of the main entries. These headings have reached the boundary line and are being worked out on the retreating plan. The rooms have been started at the inby end and driven to the limit, in regular order.

As the limit is reached in each room, the work of drawing back the ribs is commenced by cutting through the rib in No. 1 room with the machine, and setting posts for the support of the roof, as the work progresses. When the pillar has been cut back 18 ft. from the face, a stump 4 or 6 ft. in width is left, and another 18-ft. cut is made through the pillar. The stump left is then drawn with picks and the timbers pulled with a chain-puller so as to cause a fall of roof. At times, a small stick of dynamite is used to destroy a post that cannot be pulled with safety.

ESSENTIALS IN PILLAR WORK

An important feature in the work of drawing pillars is to keep the ends of the pillars in line. This gives a good line of fracture for breaking the roof, which relieves the pressure on the pillars and greatly assists the mining of the coal.

In order to remove ribs successfully, all the coal must be taken out, and if this is done conscientiously there will be no trouble. I have known of instances where thick stumps have been left in rather than pay pick prices for removing them. The result has proved, however, that this is a grave mistake, as success can only be achieved when all the coal and timbers are removed.

In other cases, a too sparing use of timber has caused trouble. It has the effect of throwing an undue weight on the pillars, which makes the coal difficult to mine and induces squeeze or creep. Enough timber must be used to hold the top perfectly sound, until the time comes to make a fall, when all timber should be removed and none left standing in the waste.

In closing, let me say that it is my belief that "Operator" will have no trouble in extracting all of his ribs with safety and economy, by adopting the methods I have suggested. This opinion is strengthened by the fact that we are working the same machines under, I might say, the same conditions. In case a mine is generating gas and locked safety lamps are required, a flameproof machine, such as the CE7 Jeffrey, Goodman, or other type, should be employed. D. F. M.

Meadow Lands, Penn.

Letter No. 2—In reply to "Operator," who asks for the best method of drawing pillars in machine mining, *Coal Age*, Jan. 2, p. 32, let me say that he has omitted one of the most essential things regarding his question; namely, the thickness of the pillars between adjoining rooms.

When mining under a sandstone roof, there is always great danger of bringing on a creep when drawing back pillars, either in pick or machine mining. Comparatively small pillars may be strong enough to bear the overburden, in driving the rooms to their limit or, as we say, in the "first working." But, when the work of taking out the pillars is started, the roof pressure will generally prove too great and the ends of the pillars will be crushed to such an extent that it becomes practically impossible to recover all the coal,

or even enough of the pillar coal to bring about a good roof fall and relieve the pressure.

At times where the coal is hard and the bottom soft, the latter will heave under the increased weight resting on the pillars. When that takes place, the pillars are forced down into the bottom, and it is impossible to use the machine or even to mine the coal remaining in the pillars.

Assuming, however, in the case presented that there is a good thickness of pillar, sufficient to bear the weight of the overburden until enough of the pillar coal can be taken out to bring about a good roof fall, it should be possible to recover all the pillar coal by adopting a proper method of working the seam. For instance, not a room should be turned, until the butt headings have reached their limit and it is possible to work out the coal on the retreating system.

Drawing Pillars in Five Rooms at a Time

Now, commencing at the inby end of the heading, five rooms should be started and driven on 60-ft. centers. The rooms should be widened to 24 ft., which will leave 36-ft. pillars between them. They should be driven to a distance of not less than 275 ft. and more, if it is possible to extend them further with safety and economy.

When these five rooms have reached their limit, the work of drawing back the pillars between them is commenced at the face of the last room but one on the heading. At this point, a crosscut is driven through the pillar, separating this room from the last one. The crosscut should be driven about the same width as the rooms.

With a sandstone roof, such as is here mentioned, it will be possible for the machine to make a cut clear across the face or end of the pillar. All props should be taken out except a good strong breakrow. This breakrow, of course, must be strong enough to protect the machine. As the work advances, and the space standing behind the breakrow becomes so great that it does not appear safe to make another cut in the end of the pillar, a second crosscut should be started and driven the same width as before, leaving a 6-ft. stump between the end of the pillar and the rib of the crosscut. When this crosscut has been driven through the pillar, it will often be possible to cut out all the stump with the machine, except 3 or 4 ft. on each end, which must be taken out with a pick.

Pillars and Rooms Worked on 45-Deg. Angle

For the success of the operation, it is important not to start to cut through the second pillar, until the first cut has been taken on the first pillar. The same plan must be followed in respect to each of the other pillars, which will make the line of the pillar work assume an angle of about 45 deg. with the heading and the last pillar will be about commencing when the first pillar is finishing.

At this stage of the work, five more rooms should be started in turn, keeping the face in each a few cuts in advance of that in the room next adjoining, so that the faces of these rooms will make about the same angle of 45 deg. with the heading, as is the case with the pillars that are being drawn back. It will be observed that the 45-deg. line marking the faces of the rooms will be opposed or at right angles to the 45-deg. line marking the ends of the pillars. When the first pillar is drawn back to the mouth of that room, the men drawing the pillar continue, by taking out the stump on the heading and the entry pillar, keeping the same 45-deg. line as before.

My understanding of the case presented by "Operator" is that he has a lot of pillars standing. Even in that case, the work of drawing the pillars should begin with the last one on the heading. If these pillars are any less than 20 ft. in width, I would start about six of them, putting in as many men as possible and working day and night, doing everything possible to induce a break in the roof. It is of utmost importance to leave no stumps remaining, but all must be removed, or blown out if it is necessary to lose the coal.

On the other hand, if the pillars are ample, the work of removing them should be started on the last pillar and the same plan followed that I have just described, keeping the ends of the pillars on a line of about 45 deg. with the heading. In removing pillars of a good thickness with machines, there should be no trouble to recover all the coal. But, if the pillars are not thick enough, there is bound to be trouble whatever method is employed for their removal.

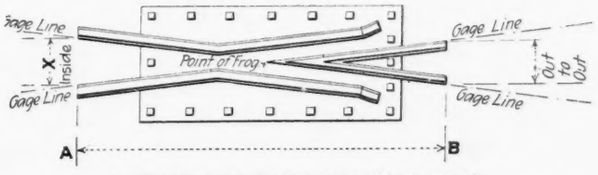
Room stumps should never be less than 50 ft. in thickness; or, when working with a single entry, a 50-ft. barrier pillar should be left to protect the entry. Never let a cutter cut out an entire stump, as the settlement of the coal will have a tendency to bind the cutter-bar and hold it fast. Always leave a small stump for the protection of the men and the machine.

McIntyre, Penn. THOMAS HOGARTH.

Mine-Track Switches

Letter No. 1—Referring to the inquiries, *Coal Age*, Nov. 21, p. 961, and Dec. 26, p. 1179, kindly permit me to draw attention to one or two points that should be emphasized, where trackmen often make an error in measuring a frog. When measuring the spread of the rails, the measurements must always be taken between the gage lines.

In a standard-gage frog, such as is used on surface railways, the gage lines are on the inside of the rails



A STANDARD-GAGE RAILWAY FROG

that form the wing rails of the frog, while at the other end they are on the outside of the rails forming the V of the frog. I might call one the "X measurement" and the other the "V measurement," the former being taken on the inside of the rails and the latter on the outside, as shown in the accompanying figure.

Let me say, here, that 95 per cent. of coal-mine frogs, however, consist of the V part only and do not include the wing rails that form the X section of a standard frog. Hence, the number of an ordinary V, or mine frog, is found by dividing the length of the V by the

spread, as measured out to out of the rails. For example, if the V is 24 in. long and the spread 8 in., the frog number is 24 ÷ 8 = 3, this being a No. 3 frog.

Speaking of the radius of a switch, let me say that few switches, in mines, are laid to any exact radius. In mine work, the radius of curvature of the lead rail is of use chiefly for aiding the calculations of the proper length of that rail, and other dimensions. In actual practice, the frog must be laid in a position, on the main track, to suit the opening at the room or heading. After passing the frog, the curve may follow any radius best suited to the conditions.

Also, conditions in mines regarding the speed and the pulling and pushing of trains, and the effect of the rope, in rope haulage, make it impracticable to estimate the proper elevation of the outer rail by the usual methods. Practical trackmen rarely exceed ⅛ of the gage, for the necessary elevation of the outer rail on a curve.

Wheeling, W. Va. R. Z. VIRGIN.

Reducing Ventilation at Firing Time

Letter No. 3—After reading the letter of John Verner, *Coal Age*, Nov. 28, p. 1000, in which he advocates reducing the circulation of air before firing shots in a nongaseous mine, I have since read Technical Paper 190 issued by the Federal Bureau of Mines, to which he has referred. The authors of that paper condemn the practice advocated by Mr. Verner, basing their conclusions on experiments made by them to determine the effect of a reduced circulation of air on the firing of shots in mines.

Taking these experiments as demonstrating the fact that such a practice is highly dangerous, I cannot see how shotfirers still cling to that method. There have been repeated explosions, and shotfirers have been killed, simply because they relied on their own experience and would not accept of what was told them. As mine statistics rarely cover cases of such accidents, except where five or more persons are killed, the many deaths of this nature that occur escape public notice.

CHIEF DANGER IN RAPID SUCCESSION OF SHOTS

As I understand it, the argument advanced in favor of this practice, emphasizes more the danger of an increased draft of air causing an explosion, rather than the firing of shots in rapid succession. To my mind, the latter condition is the more dangerous of the two.

On pages 33 and 34 of that paper it is stated that the authors kept a record of the time required to fire the shots in a certain mine, during 11 days. Two shotfirers were employed and an average of 160 shots were fired each night, the time of firing ranging from 1 hr. 27 min. to 3 hr. 45 min., although it required 30 min. for the shotfirers to reach their work after entering the mine, and the same time to reach the shaft bottom when their work was ended.

These results show a continuous firing of more than one shot a minute, in that mine, and make it certain that the shotfirers did not pause to ascertain whether any brattice had been blown down or other damage done after a shot was fired. They, undoubtedly kept on the run from one place to another.

Let me illustrate this condition, by supposing that 3 hr. is the time allowed for the firing of shots in a mine generating a very small amount of methane, say ¼ per cent., which would not be detected on a lamp. Now, if the fan is shut down before firing is commenced the air at the working face of each room will be still when the shots are fired. If gas comes from the roof or the top of the coal, it will be stratified in a thin layer and form, in a short time, a dangerous condition for firing shots.

The tables on page 26 of the same paper show that tests made in one entry, at the roof, revealed an increase from 0.29 to 2.84 per cent. of gas. In another entry the increase was from 2.52 to 3.72 in 2½ hr. The tests made in the last open crosscut, however, showed only a negligible increase in gas, making it appear that the gas accumulated at the roof in the places where it was generated, and that the air current was not strong enough to sweep it away.

Attention was drawn to the fact that, in practically all of the tests made, the oxygen content of the mine air was normal. The argument that the slowing down of the fan reduces the amount of oxygen in the mine is thus proved a fallacy. The danger from the cold air, in winter, entering a mine arises from its increase in temperature while circulating through the mine airways. This makes it possible for the air to absorb a large amount of moisture and dry out the mine, rendering it more dusty and dangerous. Let me suggest, here, that when the fan is stopped there is a fall of pressure, which may cause gas to issue from abandoned places in the mine.

URGES THAT FIREBOSSES TAKE MORE TIME

In closing, let me urge that more time be given for firing shots, and that the shotfirer should fire these in regular order, proceeding against the air. To fire 160 shots should require 5 hr., which would give ample time for the examination of each working place.

As showing the carelessness of many men, I am reminded of an incident that occurred when I was working in the Hart-Williams mine, in Illinois, Franklin County. We were timbering a pair of entries a little distance from the mouth and another gang was cleaning falls nearer the face. A certain driver had the habit of always setting open the door on the entry between the two headings, while he was waiting for a car to be loaded.

On one occasion, I shut this door, whereupon he came back and opened it and sat down against it. I was advised by my fellow workers not to make any trouble, but one can imagine my thoughts, being accustomed to work with safety lamps, where such a practice would mean danger. To my mind, ventilation is an important factor in mine safety. I want to say, in closing, that I have more faith in tests and experiments than in beliefs and theories. GASTON F. LIBIEZ.

Peru, Ill.

Letter No. 4—Whatever can be said in favor of this proposed practice in mines not generating gas, the principle cannot be applied to Pennsylvania mines where the danger of gas is almost always present.

The Pennsylvania mine law is very specific in this regard, and it can be said with truth if the firebosses

in those mines lived up strictly to the requirements of the law, there would not be much coal loaded the next day. In the fireboss' book would be found too many entries made such as "too much gas present," giving that as a reason for not shooting the coal.

Again, the Pennsylvania law demands the sprinkling of each place before firing shots, wherever gas can be detected by an approved safety lamp. While it is true that some of the most gassy mines, in this state, are the wettest and there is no need of sprinkling, it is still necessary to keep bratticemen busy and the fireboss must always make careful tests for gas, before shots can be fired. Under such conditions as these, the question of reducing the ventilation in the mine, at the time of firing shots, is an idle one. No superintendent, foreman or fireboss, would consider the proposition one moment.

I recall a miner who was working at the face of a room where a small amount of gas was generating, although not sufficient but that open lights were used. The man gave warning that he was going to fire, which he did, with the result that the gas coming from the coal fired all over the face. The funny part, however, was the man lost his head and dashed from room to room, knocking out the men's lights from their caps.

My advice is, keep a healthy circulation going, as much for the shotfirer as for the miner that his work may be done safely. R. W. LIGHTBURN.

Perryopolis, Penn.

Protecting a Mine Opening

Letter No. 1—It occurred to me when reading the short article of Raph W. Mayer, entitled "Unique Mine Portal," *Coal Age*, Nov. 14, p. 909, that it would have been possible to have secured far better results, in the case he mentions, by adopting some plan that would have permitted the mine to be operated continuously.

In his article, Mr. Mayer states that the mine opening is located in a hill that rises abruptly from the Monongahela River. The narrow bench, on the river, bank, is occupied by the double track of the Pennsylvania Railroad and, to avoid hauling the coal across the track, it was necessary to drive a tunnel, from the river, underneath the railroad.

The mouth of the tunnel, he states, was lined with heavy concrete walls extending back to the coal. As the opening was below the high-water mark of the river, it was necessary to close the mine during high water, by constructing a water-tight door, which was bolted to the face of the concrete walls of the tunnel and tightly sealed. In my opinion, the necessity of putting up and taking down this door, at each time of high water, would be a decided nuisance.

It appears to me that, providing the mining of this coal would warrant the outlay, it would have been far better to have extended the concrete walls 8 or 10 ft. further and sealed the inclosure against the inrush of water by an end wall. These walls should, of course, be carried up above high-water mark and a small tipple erected on this foundation. This would allow a balance hoist to be used for lifting the coal to a sufficient height to permit it to gravitate to the point of loading; or it could be loaded at once into the barges on the river. Such an arrangement would allow the mine to be worked continuously and would be much safer and less liable to inundation from a sudden and unexpected rise of the river. M. STAFFORD.

Chase River, Vancouver Island, B. C., Canada.

Perplexities of Mine Foremen

Letter No. 8—Having had a few years' experience as a mine foreman, and knowing some of the perplexities that he meets in his work, I would like to be permitted to cite one or two instances with which all mine foremen must contend, although these can hardly be called perplexities; they are simply troubles that a foreman must expect.

The mine of which I was foreman had no superintendent and, as a result, when things went wrong I was the one to suffer. We were working a 10-ft. seam of coal that had developed a shale-rock parting about 4 ft. from the bottom of the seam. In order to clean the coal, I put on six rock pickers at the tipple, besides employing a rock inspector, whose duty it was to see that every car that was shipped contained no rock.

Notwithstanding these precautions, however, it would occasionally happen that a car was shipped that contained a little rock and be refused at its destination. Of course, on such occasions, I would receive a personal letter from the head office, calling my attention to the fact in terms that were not fitted to put me in a good humor.

Another source of trouble was poor equipment. We were using steel cars, but had hardly enough of these to keep the mine running to its full capacity. When a wreck occurred, as it would occasionally even though we took every precaution to avoid it, one or more of the cars would be badly crippled, which necessitated such cars being sent to the shop where they would be out of service, perhaps from two to four weeks. To repair these cars, they had to be taken apart by hand, the plates straightened, and again put together by hand, as there was no machinery for performing that work.

BAD EQUIPMENT AND LABOR TROUBLES

But, one of my real perplexities came when the general manager sent me a hoist, if I could call it by that name. It was equipped with a 10-hp. motor and had a drum only 6 in. in diameter. With this hoist, he expected me to develop the main and back slopes, which had a grade of 6 per cent. against the loads. Can anyone suggest how this was to be done?

Not an infrequent source of annoyance was due to the fact that most of the men employed in the mine were Greek miners, whose knowledge of coal mining was limited. Their complaints were many. One day a miner came to me and said, "Well, boss, I no can work my place any more; too much bad top." I said, "All right, I will come up and see your place." Reaching there, I found his top a little bad, but an experienced miner would have fixed it and said nothing. I put up a post and crossbar for him and he went to work again and is there still.

On another occasion, I put two Greek miners to cutting a place through to another room, so as to shorten the haul. They fooled around three days, and then came to me and said, "We no can make nothing in that place;

coal too hard; too much money for powder." I said, "All right," and gave them a change. I then put two Americans to work in the same place and they made $315 clear of expense, the first full month they worked the place.

It was my misfortune to hire a young fellow as a motor nipper, but whom I found, later, to my sorrow, was a pro-German. The first two days he worked fine; the third day be caused a slight wreck, and the fourth day a larger one that stopped the mine all day. I wanted to have the man arrested, but the manager told me to give him his time and tell him to get out of town as quickly as possible, which I did.

In a machine mine, the foreman is always confronted with the possibility of a machine breaking down when cutting the coal at night. Then, if there is no mechanic or electrician around, the machineman goes home and there is no more coal cut that night. The next morning the mine foreman goes to the mine only to find the men complaining that their coal has not been cut.

Notwithstanding this scarcely avoidable occurrence, the management expect the foreman to keep the mine running. If the day's tonnage falls short, the foreman gets another letter that does not add to his pleasantness. But the foreman must maintain his equilibrium, under these trying circumstances, and do his best to keep his temper, which is one of the important assets of a good foreman. PATIENCE.

———, Utah.

Letter No. 9—The case of the miner who complained to his foreman that the machinerunner had left several inches of bottom coal in his place, as described in a foreman's letter on this subject, *Coal Age*, Oct. 24, p. 793, has attracted some comment. In most respects, I agree with the Homer City miner, whose letter appears in the issue of Dec. 26, p. 1176, and who gives good advice.

In the first place, a mine foreman is responsible for some of his own troubles, which may come from not using proper discipline at the right time. A machinerunner has no right to be careless in cutting a man's coal, and the foreman should be particular to train his men in this regard, and see that each man's place is properly cut. Perhaps more bottom coal was left in this man's place than was necessary and, if so, the man was right in complaining to the foreman. But, assuming that the machinerunner was a member of the same organization as the miner, they were brothers, and one brother would not care to wrong the other or do so intentionally.

THE CASE REFERRED TO THE MINE COMMITTEE

The matter, in this case, being referred to the mine committee, it would seem that their duty was to call each of these men to meet them and to listen to their statements so that they, as a committee, could arrive at a proper judgment. Trouble often comes from a lack of proper understanding between the parties. It is not good policy for either a foreman or the mine committee to be obstinate. Right is sure to win.

Too often men expect too much of the mine foreman, especially if he is what they call "easy." Such a foreman will often make a concession rather than have trouble with his men. This foreman may have been justified in offering the miner extra pay for cutting out the coal that had been left; but, in doing so, there is always danger of establishing a precedent that will compel him to do the same thing again. Let me cite an instance where that occurred.

At a certain mine, the development was not sufficient to supply the demand for coal. As a consequence, men were waiting for places. In order to expedite the work, the foreman offered the entrymen 25c. a yard extra because rooms had to be turned as quickly as the entry was advanced, and this made trouble for the men driving the entries. The foreman promised that the extra pay would be continued as long as the conditions continued.

Not long after, however, there was a change in foremen, at the mine. The new man remained only six or seven months and a third man came to take his place. The company was still paying the extra yardage, although the conditions that required this had ceased. A little later, the office asked for the reason why the price paid for yardage was 25c. higher at this mine than at any of the others, and told the foreman he must go back to the old price.

UNFAIR AND ARBITRARY RULING OF COMMITTEE

When this decision was announced to the men, they at once took up the matter at their regular meeting, and the mine committee was instructed to notify the officials that there would be no more work done, unless the men were paid the same price as before. They admitted that the conditions that required the extra pay no longer existed, but claimed that custom makes a law and that the price was not changed at the time the conditions ceased. Probably that was owing to the foreman not wishing to do anything that would cause trouble.

It has been suggested that a miner is justified in expecting his share of the profits from the increased demand for coal. In my estimation, miners are receiving their just dues. They forget that coal companies have been put to extra expense in order to produce a larger tonnage with fewer men. New equipment and material have been required that were not needed under the old conditions. At the same time, the miner's pay has been advanced from $3.60 to $5 per day.

It is only right to ask what have the miners done in return for the advance made them. It must be admitted that a large majority of our miners have worked fewer days owing to their necessities being relieved by the increased pay that they received. There were some who would lay off to visit another mine where they had been told the men make more money. Eager to make the same, some have given up their places and gone to other mines, only to find that they have been wrongly informed and have returned to their old places, all of which means loss of time. Others not wishing to acknowledge their mistake, have taken up other work and will never go back to the place they were foolish enough to quit.

The increased price paid for digging coal has made it harder for a foreman to secure good daymen, because men can earn better money digging. A certain machinerunner who drew, on three successive paydays, $214, $170 and $186, asked the foreman to get another man in his place, claiming that his wife was sick. These are a few of the perplexities of mine foremen.

———, Penn. ANON.

INQUIRIES OF GENERAL INTEREST

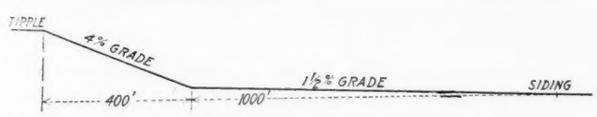
Engine-Plane Haulage

Kindly allow me to present a problem with which we are confronted in our mining operations. It is in regard to a proposed engine-plane haulage, extending from a sidetrack in the mine to the tipple on the surface. As indicated in the accompanying profile, starting from the sidetrack there is an upgrade of 1½ per cent. for a distance of 1000 ft., to the foot of an incline having a grade of 25 per cent.

The incline, which is 400 ft. long, has been previously operated as an engine plane; but we desire, now, to drop the loaded cars from the top of the plane the entire distance to the sidetrack in the mine. The loaded cars weigh 5000 lb., and the empties 1500 lb., each. There are three cars hauled in a trip. The daily output of the mine is 500 tons. I want to ask if the proposed plan will work successfully; if not, please explain the method of finding the flatest grade we can use and the size of engine required for the work. W. M. Q.

———, Penn.

It is difficult to obtain a clear idea of what this inquirer has in mind when he asks for "the flatest grade that can be used." The situation, as we understand it and as illustrated in the figure, consists of a 25 per cent.



PROFILE OF A PROPOSED ENGINE-PLANE HAULAGE

grade, forming an incline 400 ft. in length and running from the tipple floor into the mine. From the bottom of this incline an entry runs to the dip, on a grade of 1½ per cent., for a distance of 1000 ft., to the side track in the mine.

The weight of a loaded car being 5000 lb., a three-car trip would weigh 15,000 lb. To handle this trip on a 25 per cent. grade, assuming a track resistance of, say, 20 lb. per ton of load hauled and using a factor of safety of 5, will require a ½-in. crucible, cast-steel haulage rope, weighing 0.39 lb. per foot.

The test of the system will come when the three-car, empty trip, weighing 4500 lb. is approaching the side track and must drag the entire length of the rope behind it. The gravity pull, less the track resistance of the empty trip, at this point, is only about 22.5 lb. The gravity pull of the entire length of rope on both grades, may be about 45 lb., which makes a total force of 67.5 lb., acting to drag the rope from the winding drum and over the rollers on the track.

It is difficult to say if this force is sufficient to overcome the rope friction without more definite data for estimating the resistance. One thing, however, seems certain and that is it would not be possible, in this system, to make the number of trips required to put out 500 tons of coal per day. A three-car trip would carry $3(5000 - 1500) \div 2000 = 5.25$ tons, which would require $500 \div 5.25 = 95$ trips or, say a trip every five minutes, hauling 8 hours a day. *Coal Age* submits this question for further consideration by its readers.

Mule Power in Mine Haulage

We are desirous of ascertaining what is a fair estimate of the work that a good average mine mule or horse will perform when working under average conditions, in a level seam. Also, how does the question of grade affect mule haulage? This is a matter on which I have been unable to find reliable information based on coal-mining practice; and, as the question has presented itself several times recently, I shall appreciate any assistance that is available. H. R. S.

Plymouth, Ohio.

The work that a mule will perform in a mine will depend not only on the size and weight of the mule and conditions regarding track, rolling stock, grades and headroom on the haulage road; but also on the character and skill of the driver, the length of haul and time lost in changing trips or waiting for loaded cars. It is clear, then, that this question is not solely one of how much a good mule can haul on a level track.

Observations taken, from time to time, in practically level seams and under fairly average conditions in coal mining, make the estimated work of an average mine mule about 6 or 7 ton-mile hours; that is to say, the average mine mule will ordinarily handle, say 200 tons of coal, on a quarter mile haul, in 8 hours. In other words, for an output of 1000 tons of coal a day, five mules would be required, on a quarter mile haul.

It is understood that this is only an average estimate based on fairly good coal-mining conditions in respect to the several items previously mentioned. The tractive power of a mine mule is commonly estimated as one fifth of its weight; and, taking the track resistance of the mine cars as, say 20 lb. per ton, or 1/100 of the gross load hauled, it may be assumed that an average mule will haul twenty times its own weight, on a level track. In other words, a mule weighing 8 cwt. may be assumed to haul a gross load of 8 tons, on a level track.

The tractive power of a mule, however, decreases rapidly with an increase of grade of track. A 3 per cent. grade should be considered as the limiting, uniform grade on which a mule should be obliged to haul, for any great time or distance. When a haulage road has a varying grade of ups and downs, the impetus given the trip on the downgrade will often permit a mule to haul the load up the upgrade following, without inconvenience, although that grade may exceed the limit of 3 per cent. just mentioned. The 3 per cent. limit applies only to a continuous upgrade.

EXAMINATION QUESTIONS

British Columbia Examination Second Class, Dec. 17, 1918

(Selected Questions)

Ques.—What is meant by diffusion of gases? Explain Graham's law of diffusion.

Ans.—The term "diffusion," as applied to gases, relates to the mutual intermixing of the molecules of two or more gases when in contact with each other. Diffusion takes place according to a fixed law known as Graham's law of diffusion. The law states that the rate of diffusion of gases into each other or into air varies inversely as the square root of their densities, or specific gravities when referred to air as unity.

For example, in the diffusion that takes place between a body of pure methane and air, the relative velocities of their molecules are as $\sqrt{1}:\sqrt{0.559}$; or 1: 0.748. That is to say, for every volume of the gas passing into the air, there will be 0.748 vol. of air passing over into the gas. The mixture resulting when diffusion first starts between pure methane and air will therefore consist of 1000 parts of the gas to 748 parts of air. The specific gravity of the gas mixed with air is at once increased to 0.748, and the diffusion is less and less rapid as the specific gravity of the mixture approaches that of air.

Ques.—Is it possible that an explosion of firedamp in a safety lamp would be of sufficient force to pass the flame through the gauze? Explain fully.

Ans.—If the firedamp mixture entering and filling the chimney of the lamp is inflammable only small balloons of flame will be seen to arise from the combustion chamber of the lamp and disappear in the gauze chimney above. But, if the mixture is within the explosive range of the gas more or less violent explosions will take place within the lamp. The violence of the explosion, however, will be greatly modified by the presence of the burnt air and gas accumulated in the upper part of the chimney.

As the mixture entering the lamp approaches more closely to the maximum explosive point of the gas, sharp crackling sounds will be heard and the violence of these explosions increases. If the lamp is not now cautiously and promptly withdrawn from the mixture, the explosive action continuing within the lamp will drive out the accumulated burnt air and gas from the gauze chimney above, and it is then possible for a violent explosion to occur within the chimney and force the flame through the mesh of the gauze and ignite the gas surrounding the lamp.

Ques.—How would you remove a large body of firedamp from a section of the mine where the ventilating current is insufficient, without unduly reducing the quantity of ventilation in other sections of the mine?

Ans.—The removal of a large body of firedamp from a section of a mine where the ventilating current is insufficient will require increasing the quantity of air circulating in that section. Before anything is done, however, safety demands the withdrawing of all the men from the mine, except those engaged in the work of removing the gas.

It is possible to obtain some increase in circulation in the gassy section, by robbing the circulation in other sections of the mine, without unduly reducing the quantity of air required to keep those sections clear. But, for a further increase of the circulation in the gassy section, recourse must be had either to increasing the speed of the fan or assisting the ventilation by removing any possible obstructions in the airways, and by erecting special brattices to deflect the air current against the accumulated body of gas.

Only experienced men equipped with approved safety lamps must be employed for this work. Sufficient time must be given for the air current to act upon the gas and frequent tests must be made to ascertain the progress of the work. In the meantime, the lamps in use must be guarded as much as possible against a sudden rush of air should a fall of roof take place in the section.

Ques.—To what are explosions in coal mines due? Describe the varying conditions that may cause or contribute to an explosion, and state what precautions you would take to prevent them.

Ans.—Explosions in coal mines result from the ignition of a body of firedamp or a cloud of dust floating in the mine air. The ignition may be due to contact with the flame of a naked lamp, a defective safety lamp, or the improper use of a safety lamp by an inexperienced person. Ignition may be caused by the blowing out of an electric fuse, sparking of wires or electric motors, the breaking of an incandescent lamp, a gob fire, the ignition of a gas feeder in blasting, and a number of other causes producing heat or flame.

The accumulation of gas in void places in the roof or in abandoned workings; or accumulations of fine inflammable dust at the working face and on the roadways; or the use of mixed lights in mines requiring locked safety lamps in one or more sections; or the excessive use of powder in blasting the coal and the lack of judgment and experience in placing shots: all present conditions that contribute to an explosion taking place in the mine.

In order to avoid the occurrence of explosions in mines, it is necessary to remove the causes that contribute to produce them. The workings must be thoroughly inspected for gas, both before the men enter their places for work and while they are at work. All shots should be inspected, charged and fired by competent shotfirers. All electrical installations should be made by competent mine electricians. The roadways and air-courses should be kept free from accumulations of dust. In machine mining, the cuttings should be loaded out of the mine. No fine coal or slack should be stored in the waste. Eternal vigilance is the price paid for safety.

COAL AND COKE NEWS

Harrisburg, Penn.

Bituminous coal production in the central Pennsylvania field has been reduced approximately 35 per cent. because of a lack of demand for coal. Rather than demoralize the market by cutting prices, operators are closing down the mines temporarily. A little coal has been sold under the Government prices at $2.95, but it had already been mined and was loaded on cars awaiting shipment. Coal operators say the supply is long all over the country, especially in New England, where many of the large consumers have a stock on hand sufficient to last them from four to seven months. At tidewater points the demand has also suddenly dropped.

The outlook for both miner and operator in the central coal fields is becoming darker each day, and many miners will be out of employment. About ten days ago two operations in the Altoona section closed down, one at Woodland and the other at Kersey. Since that time the number has continued until at present it is estimated that fully 250 mines in the central territory are at a standstill. These are small mines, employing from ten to fifty men. Nine of the larger mines of the district have closed.

It is estimated that there were 400 wagon-loading mines in this section, and of that number comparatively few are working. In the vicinity of Phillipsburg production has fallen off alarmingly and the few mines now operating have only a few men at work. At Reynoldsville production is at a standstill, and at Kittanning many men have been discharged for lack of orders.

All of the large mines in Cambria County are working, but a score of the small ones have shut down completely and probably forty others are working only half time. These shutdowns are, in the main, due to the fact that only the best quality of coal is in demand, and that the small producer, who could sell any kind of coal before the war ended, has no market for his product at this time. The mild weather is also responsible for the falling off in production for the smaller mines throughout the state.

Uniontown, Penn.

Through a system of underground haulage the output of several mines of the H. C. Frick company is being taken out at the mouth of the Alice mine, near Charleroi, for transportation down the Monongahela River to the Clairton byproduct plant. The longest haul now made is over a distance of 2½ miles, but the system will be extended shortly to handle the output of the Colonials, covering a haul of approximately 4½ miles.

When the entire underground system is completed the longest haul will be in the neighborhood of eight miles. This plan eliminates haulage, openings at many plants, provides quicker transportation and means an immense saving in time, plant operation, labor and shipping.

The Frick company has not adopted the plan of a number of independents in observing "layoff" days. All plants are working six days a week, but the relaxing of the labor situation due to the return of soldiers and the suspension of the team-track mines has resulted in the elimination of extra shifts and overtime, which was used so extensively during the war in increasing production.

There was a drop of 35,000 tons in the output in the Connellsville region during the week ended Jan. 25, due principally to curtailed operations at the independent plants. A still further curtailment is presaged for the current week. The aggregate output was 604,331 tons, from which there was manufactured 276,416 tons of coke. Raw coal shipments aggregated 189,707 tons.

Charleston, W. Va.

More than two thirds of the production loss in the Pocahontas and Tug River districts was due to no market. New England buyers, it is said, are withholding orders in the hope that prices will decline and that is responsible for an accumulation of tidewater shipments. It is prodicted by Pocahontas coal men that instead of Pocahontas prices being lower they will probably advance as soon as there is the slightest hardening of the market. Prices quoted for run of mine coal in the Pocahontas district range all the way from $2.35 to $3.

Production has been affected to some extent in the Fairmont region by the attitude of the railroads, which, it is claimed by producers, are determined to secure their supplies of fuel at lower prices than are now prevailing; and since much Fairmont coal is used for railroad fuel, this is said to be making some difference in the amount of coal sold in the region. Coal is no longer requisitioned for the railroads. The new difficulties which have arisen may assume equal importance to those in controversy when the question of assigned cars was paramount. Embargoes are now in effect in connection with shipments consigned to Staten Island and Arlington piers.

Market conditions in general are responsible for low production in the Kanawha region, where the output is far below normal. In fact, insofar as it is possible to tell, operations, generally speaking, are limited to about three days out of a week, and consequently overhead expense is running high. This in turn is effectually having a tendecy to make prices firm. Summer weather throughout the country has played an important part in holding down production in the Kanawha district.

Congestion is affecting operations in the New River district to as great an extent as it is elsewhere in the state. One result of congestion was seen in the district on Jan. 27, when the Shipping Board imposed an embargo on tidewater coal which may be in effect for several weeks. Operators hope to offset their inability to ship to the east by beginning the shipment of coal to the West within a week or so, now that there are no longer any zone restrictions.

Victoria, B. C.

The Government of the Province of British Columbia has announced that it will stand by the settlers of Vancouver Island who are claiming the coal rights in connection with the lands they occupy providing they can prove that such claims are based on sound premises. It will be recalled that the Dominion Government last year disallowed the Provincial Act, giving the settlers a further period in which to record their applications, this measure being termed "An Act to amend the Settlers' Rights Act, 1904." One of the objections taken by the Federal Administration is that such legislation proposes to authorize the alienation of rights which were conveyed by the Province to the Dominion and by the Dominion conveyed to the Esquimalt & Nanaimo Railway Co. in consideration of the latter constructing a railway on the Island.

Among other points advanced by the Provincial Government in its answer is that there is no difference in principle between the Act of 1917 and that of 1904, both being identical in character, and that the Dominion is inconsistent in disallowing the one and allowing the other to stand. This legislation, and the conflict which it has caused between the Federal and Provincial Administrations, involves title to considerable of the undeveloped coal areas of the Island. This is now, for the most part, in the hands of the Canadian Collieries (D) Ltd., to which company it was transferred by the Esquimalt & Nanaimo Ry. Co.

Acting on instructions from Hon. William Sloan, Minister of Mines, the Chief Inspector of Mines of British Columbia has arranged for a series of practical tests of the efficiency of the Gibbs mine rescue apparatus and the Paul breathing apparatus. These began on Tuesday, Jan. 28, at the Government mine rescue station at Nanaimo and will continue until the efficiency of the machines is thoroughly demonstrated.

PENNSYLVANIA

Anthracite

Lykens—A number of miners were penned in the mines for several hours recently when a string of cars broke loose on the electric slope and dashed to the bottom, tearing out the props and letting loose about fifty tons of coal and rock.

Larksville—Responding to an advertisement of the Hudson Coal Co., carpenters by the dozen, with their tool chests, applied at the Plymouth No. 5 colliery the day after the big breaker burned, and every applicant was put to work. The intention is to push erection of the new breaker to completion with the utmost dispatch.

West Pittston—A cave-in which recently occurred on Elm St. is supposed to be due to the abandoned workings of the old Clear Spring mines. A considerable area was affected. No damage resulted, as no properties are located in the area disturbed. J. L. Cake, owner and manager of the colliery, was on the scene shortly afterward and had men filling in the hole with ashes

Bloomsburg—Representatives of the various coal companies operating in Columbia County met with the county commissioners on Jan. 28, regarding the assessment of coal lands. The commissioners, believing that the coal companies have not been paying a just tax because of the low valuation at which their land has been assessed, some time ago employed M. J. Flynn, a mining engineer, as an expert to assist them in fixing a proper valuation.

Upper Lehigh—The project started by the Anthracite Forest Fire Association to fight against forest fires in the hard coal region has the hearty support of the anthracite coal operators. This place was selected for a new lookout tower to be erected by the association on a site for which the M. S. Kemmerer Coal Co. has given full rights. Telephone communication enables prompt advice and location whenever a fire starts. The nearest tower to Upper Lehigh is located on Broad Mountain, south of Hudsondale colliery, and enables the guard on duty to see the surrounding country for miles. It is expected that more of these watch towers will be erected by the coal companies in various parts of the mining region.

Hazleton—"Broken time" has again come to the anthracite field, after nearly four years of steady, high-pressure production. Upper Lehigh and Hazle Brook, both Wentz collieries, will operate five days. Beaver Brook colliery of Dodson & Co. will work four days a week. Madeira Hill & Co., operating at Harleigh and in the Schuylkill region, will work three days. The Lehigh Valley Coal Co. went on a seven-hour a day schedule last week. G. B. Markle & Co., of Jeddo, will work full time, storing its surplus coal. The Lehigh and Wilkes-Barre has not curtailed its working time as yet. With the shorter time all repair work and overtime has been stopped. The Wentz companies have all employees on a strict eight-hour basis. Washery and culm bank operations are nearly all suspended, and stripping work and development is practically dead.

Bituminous

Clearfield—Three miners, all residents of this section, were killed on Jan. 29 when a pocket of gas in the Goodyear mine at Smoky Run exploded. The victims were blown into a pool of water by the force of the explosion. The bodies were recovered.

Uniontown—First steps toward the conquest of Cuban fuel markets by Fayette County coal and coke will shortly be made by a party of Uniontown coal men and bankers. Wilmer H. Wilkey, Jacob H. Linn, A. Plumer Austin, J. Edgar Hustead and Harold W. Semans, representative local fuel producers and capitalists, sailed from New York on Jan. 26 and will spend several weeks examining the Cuban market conditions with a view to exporting Fayette County coal and coke to the island. Other local interests are planning for the investigation of South America also.

Uniontown—Verdict of accidental death with no blame attached to W. J. Rainey was returned by the coroner's jury inquiring into the dealth of Samuel Hardy and William C. Foltz, miners, asphyxiated at the Mount Braddock mine Tuesday, Jan. 21, when a fire on a slate pile on the surface burned through to the working. The inquest was conducted by Mine Inspector Richard Maize, who commended highly the work of Mike Sostchech, Frank Krum and August Klaus, members of the Orient rescue team, who performed valiant rescue work.

WEST VIRGINIA

Gilmer—Parkersburg and Clarksburg people have acquired control of the Gilmer Fuel mine located at this place on the Coal & Coke Ry., this company having been owned and operated prior to this time by outside capitalists.

Cameron—Further information obtained in connection with the plans of the recently organized Dunkard Valley Coal Co. discloses the fact that a drift mine will be operated here by the company and that the estimated capacity of new work in tons per day will be 2500. No development work, however, has been started, but such work will be commenced soon. Equipment and material needed has not so far been ordered. The office of the company will be in Morgantown.

OHIO

Lima—The Lima Coal Co. will soon begin the work of opening a new mine near Charleston, W. Va. The mine has been projected for several months, but only recently was permission secured from the Railroad Administration to build the necessary switch. The mine will have a capacity of about 400 tons daily. It is located on the Coal & Coke Ry.

Chillicothe—A 6 ft. vein of good quality cannel coal has been discovered on the farm of Nelson Johnson, in Franklin township, Ross County. The extent of the vein is undetermined.

Pomeroy—At the annual meeting of Subdistrict No. 2 of District No. 6 of the United Mine Workers of America, George Cecil of Wellston was elected president; William Lamb of Jackson, vice president, and Henry F. Bartles of Minersville, secretary-treasurer. A new board was also elected.

INDIANA

Vincennes—About 30,000 lb. of mine powder and the brick house in which it was stored were burned in a fire of undetermined origin at the Oliphant-Johnson Coal Co. mine, at Bracewell near this city. Mine officers state that the loss cannot be estimated at this time. The fire was discovered about an hour before time for the men to enter the mine. The powder house was located a short distance from the fan-house, which supplies the mine with fresh air, and smoke blown into the mine made it impossible for the men to work. The dynamite building is located some distance from the powder-house site. Had the powder been of the explosive kind the disaster would have been much more serious.

ILLINOIS

Caseyville—The shaft of the Ruby mine here caved in a few days ago, throwing 75 men temporarily out of work.

Christopher—The Illinois Public Utilities Commission has approved an agreement of the Burlington R.R. with the Old Ben Coal Co. relating to the construction of a 33,000-volt electric power transmission line.

Danville — The Illinois Public Utilities Commission has approved an agreement with the Missionfield Coal Co., relating to the construction and maintenance of a 2300-volt electric power transmission line at Oakwood, Ill.

ARKANSAS

Hartford—The Central Coal and Coke Co. has installed a 7 ft. 6 in. x 5 ft. Sirocco fan at its No. 4 mine.

Foreign News

Sydney Mines, N. S.—President D. H. McDougall, of the Nova Scotia Steel and Coal Co., announces that the company will take advantage of the slack spell in steel production to overhaul its plant and make necessary repairs and additions. The cost of production at the collieries has been for some time past extremely high, rendering it impossible to compete in the general coal market and affecting the cost in iron and steel production. It is hoped to effect such improvements as will enable the company to resume its position in the coal market. The plans include the installation of new and thoroughly up-to-date byproduct coking ovens. The company also proposes to push development at the Wabana iron ore mines, in Newfoundland, so as to enable the production of iron ore much in excess of its former output at materially reduced costs.

Personals

H. C. Price has been transferred from the Ennis mines of the Turkey Gap Coal and Coke Co., to the superintendency of the mines at Dott, W. Va.

R. Q. Mahoney has resigned his position as mine foreman for the Turkey Gap Coal and Coke Co., Dott, W. Va., to engage in the automobile repair and supply business.

W. L. Honaker, who has been assisting W. C. Cooper with the engineering work in West Virginia, has accepted a position as mine engineer with the Superior Coal Co., Superior, W. Va.

William C. Moore, of Terre Haute, Ind., resigned Feb. 1 as assistant state mine inspector. Mr. Moore has served for the past three or four years, working chiefly in Vigo and Clay Counties.

D. H. Frazier, for the past seven years superintendent of the Turkey Gap Coal and Coke Co.'s mines at Dott, W. Va., has resigned and is now with the Mallory Coal Co., in Logan County, as general manager.

H. G. Happersett, until recently cashier of the Bank of Matoaka, Matoaka, W. Va., severed his connection with the bank and has accepted a position as superintendent of the Bradshaw Coal Co. Bradshaw, W. Va.

E. J. McKiernan, chief clerk at the Alliance Colliery of the Alliance Coal Co., has been promoted to the position of sales manager for the Alliance, Harewood and Cranberry Creek companies, with offices at West Hazleton, Penn.

John W. Smith is the new general superintendent of the Ingram Branch Coal Co. operating in Raleigh County. Before becoming associated with the Ingram company, Mr. Smith was the superintendent of the Alpha-Pocahontas Coal Co., at Alpoca, W. Va.

Edward H. Coxe, of Pittsburgh, Penn., has been appointed general manager of the Snowden Coke Co., to succeed Isaac Taylor, of Uniontown, who was recently elected president of the company. Mr. Coxe will be located at Brownsville, and have his office at Braznell, near Brownsville.

George Fraser has resigned the position of superintendent of the coal-mining operations at Cassidy's, Vancouver Island, of the Granby Consolidated Mining and Smelting Co. **George Hargreaves** also has resigned the position of mine manager. The duties of both the foregoing offices have been assumed by **R. R. Wilson**, formerly general superintendent of the Crow's Nest Pass Coal Co. Mr. Wilson is a son of W. R. Wilson, general manager of the Crow's Nest Pass Coal Company.

C. M. Moderwell has been appointed "Manager for the Receivers" of the O'Gara coal properties in Southern Illinois. The receivers are to be congratulated on their choice, as Mr. Moderwell is a man of very great experience in the coal industry, especially in Illinois. For a long time he was president of the United Coal Corporation, operating mines in the Franklin County district. When those mines were sold to the Old Ben Coal Corporation, he was connected with that concern in the capacity of vice president. Later on he resigned, and gave all his time to C. M. Moderwell & Co., a firm engaged in the jobbing business in Chicago.

Obituary

John B. Frost, superintendent of transportation for the Uniontown (Penn.) mines of the Oliver & Snyder Steel Co., died recently at his home at Uniontown. Mr. Frost had held that position for 18 years.

Joseph Earl Beury, one of the leading coal operators of the New River field of West Virginia, succumbed after a brief illness to an attack of influenza on Saturday, Jan. 25, at Turkey Knob, W. Va. Mr. Beury leaves a widow and five children.

William Ernest Minor, vice president and general manager of the Reliance Coal Co., Cincinnati, Ohio, died on Jan. 25 at Washington, D. C., of appendicitis, following an operation as the result of an attack which occurred as Mr. Minor was preparing for a hunting trip. Mr. Minor was widely known in the coal trade, with which he had been long and successfully connected. He was a Yale graduate of 1900, and was for a time connected with the Standard Oil Co. Mrs. Minor and four children survive him. He was 41 years of age.

Coming Meetings

Northern West Virginia Coal Operators' Association will meet at Fairmont, W. Va., Feb. 11. Secretary, F. J. Patton, Fairmont, W. Va.

Appalachian Coal Operators Association will meet at the Seelbach Hotel, Louisville, Ky., Feb. 14. Secretary, James E. McCoy, Knoxville, Tenn.

New England Coal Dealers' Association will hold its annual meeting March 19 and 20 at Worcester, Mass. Secretary, C. R. Elder, Boston, Mass.

National Foreign Trade Council will hold its sixth convention at the Congress Hotel, Chicago, Ill., April 24-26. Secretary, O. K. Davis, 1 Hanover Square, New York City.

Canadian Mining Institute will hold its annual meeting March 5-7 at the Windsor Hotel, Montreal, Canada. Secretary, H. Mortimer-Lamb, Drummond Building, Montreal, Canada.

American Institute of Mining Engineers will hold its 119th meeting Feb. 17-20, 1919, in the Engineering Societies' Building, New York City. Secretary, Bradley Stoughton, New York City.

American Institute of Electrical Engineers will hold its annual midwinter convention Feb. 19-21 at the Engineering Societies Building, New York City. Secretary, F. L. Hutchinson, New York City.

Recent Coal and Coke Patents

Gas Producer. A. M. Gow, Duluth, Minn., 1,272,252, July 9, 1918. Filed Dec. 20, 1917. Serial No. 208,079.

Coal Mine Drill. J. A. Walker, Springfield, Ill., 1,271,396, July 2, 1918. Filed Apr. 5, 1918. Serial No. 226,892.

Coal Mining Machine. A. Rea, Helper, Utah, 1,271,617, July 9, 1918. Filed Feb. 14, 1918. Serial No. 217,134.

Automatic Furnace Grate. C. A. Horn, New York, N. Y., 1,271,710, July 9, 1918. Filed June 2, 1917. Serial No. 172,416.

Coal Mine Trap Door. T. Lewis, Frankfort Heights, Ill., 1,291,796, July 16 1918. Filed May 25, 1917. Serial No. 171,062.

Grate and Grate Bar. A. C. Brazil, Rio de Janeiro, Brazil, 1,272,906, July 16, 1918. Filed Jan. 29, 1918. Serial No. 214,384.

Mining Machine. H. A. Kuhn and W. W. Macfarrin, Pittsburgh, Penn., 1,273,503, July 23, 1918. Filed Jan. 14, 1909. Serial No. 472,304.

Combustion Accelerator for Boiler Furnaces. G. W. Wyman, Delmar, Del., 1,271,983, July 9, 1918. Filed June 26, 1917. Serial No. 177,073.

Automatic Damper for Stoves and Furnaces. M. Lezius, Cleveland, Ohio, 1,272,064, July 9, 1918. Filed Nov. 30, 1914. Serial No. 874,694.

Ash Conveyor. A. Girtanner, assignor to American Steam Conveyor Corporation, Chicago, Ill., 1,272,794, July 16, 1918. Filed Feb. 12, 1917. Serial No. 148,102.

Stoker Driving Mechanism. M. Alpern, assignor to American Engineering Co., Philadelphia, Penn., 1,271,649, July 9, 1918. Filed Oct. 2, 1914. Serial No. 864,620.

Gas Producer Feeding Mechanism. C. W. Lummis, assignor to Morgan Construction Co., Worcester Mass., 1,270,962, July 2, 1918. Filed Mar. 10, 1916. Serial No. 83,396.

Means for Operating Overhead Valves of Coaling Apparatus. W. E. Hale, assignor to R. H. Beaumont Co., Philadelphia, Penn., 1,272,037, July 9, 1918. Filed Dec. 5, 1917. Serial No. 205,520.

Publications Received

Miners' Safety and Health Almanac for 1919. Compiled by R. C. Williams, Assistant Surgeon, United States Public Health Service. Miners' Circular 24. Department of the Interior, Bureau of Mines. Illustrated, pp. 48, 5¾ x 9 inches.

Natural Gas: Its Production, Service and Conservation. By Samuel S. Wyer, of Columbus, Ohio. Smithsonian Institution, United States National Museum. Bulletin 102, Part 7. The Mineral Industries of the United States. Illustrated, pp. 67, 6¼ x 9¾ inches.

Trade Catalogs

Economy Drawing Tables and Sectional Filing Cases. Economy Drawing Table and Manufacturing Co., Adrian, Mich. Catalog N. Pp. 32, 7 x 10 in., illustrated. Sectional filing cases and specialties of a kindred nature.

Lakewood Clam Shell Buckets. Lakewood Engineering Co., Cleveland, Ohio. Bulletin No. 26. Pp. 24, 8½ x 11 in., illustrated. The principal features of the design and construction of Lakewood clam shell buckets are pictorially described.

Jacobsen Balanced Horizontal Screen and Picking Table. Jacobsen & Schraeder, Inc., Chicago, Ill. Bulletin. Pp. 4, 8½ x 11 in., illustrated. Describes the operation of the equipment and enumerates some of the advantages of the Jacobsen balanced shaker screen.

Sullivan "WA-5" Air Compressor. Sullivan Machinery Co., Chicago, Ill. Bulletin 75-D. Pp. 12, 6x9-in., illustrated. Describes a small, reliable steam-driven compressor built for standard pressures in capacities from 100 to 500 cu. ft. of free air per minute.

Fairmont Railroad Car Retarder. Fairmont Mining Machinery Co., Fairmont, W. Va. Bulletin No. 10. Pp. 4, 6 x 9 in.; illustrated. Describes a device for handling railroad cars under the tipple, the car being at all times under the control of one of the trimmers on the car. Possesses features of safety, economy and efficiency.

The Theory of the Storage Battery. General Lead Batteries Co., Newark, N. J. Technical Bulletin No. 28. Pp. 16 + cover; 6 x 9 in.; illustrated. Aims to give those who are interested in storage batteries and their construction an account of the recent improvements in manufacture, and to correct some erroneous ideas regarding their performance.

For Fuller Acquaintance. Beckwith Machinery Co., Pittsburgh, Penn. Circular. Pp. 12 + cover; 9¾ x 12¾ in.; illustrated. Just what its title implies—information relative to the company's organization facilities in Pittsburgh. Interior and exterior views of the factory and warehouse are given, with a partial description of the machinery handled.

Industrial News

Indianapolis, Ind.—The Morris Coal Co. has increased its capitalization from $10,000 to $30,000.

Jasonville, Ind.—The Jasonville Fourth Vein Coal Co. has increased its capital stock from $10,000 to $40,000.

Freeburg, Ill.—The Mulbery Hill Coal Co., of this place, has increased its capital stock from $7,200 to $60,000.

Terre Haute, Ind.—The Glenjean Coal Co. has been incorporated with capital of $100,000, to engage in coal mining.

McArthur, Ohio—The Ferris Coal Mining Co. has been chartered with a capital of $25,000 by George L. Ferris and others.

Oakland, Cal.—The Merchant Calculating Machine Co. announces the opening of an Eastern sales office at 237 Railway Exchange Building, Chicago, Ill.

Toledo, Ohio—The Zanesville & Western Coal Co. has been chartered with a capital of $50,000 by I. W. Sharp, B. S. Brady, J. G. Backman, A. Cullen and H. A. Mullen.

Louisville, Ky.—The Louisville Coal and Coke Co. has filed notice of an increase in its capitalization from $15,000 to $25,000, to provide for general business expansion.

Indianapolis, Ind.—The Indiana and Eastern Coal Co. has been incorporated with capital of $25,000 to engage in the mining of coal. The incorporators are Edward A. Ogle, Ward H. Hackleman and Burrell Wright.

Raven Run, Penn.—The Raven Run Coal Co. has filed articles of incorporation with a capital of $1,000,000 to operate coal properties in the Raven Run district. H. B. Price, Philadelphia, is the principal incorporator.

Louisville, Ky.—The Louisville Coal and Coke Co. has filed amended articles of incorporation increasing its capital stock from $15,000 to $25,000. The amendment was signed by M. M. Kling, H. J. Kling and J. L. Eyl.

Terre Haute, Ind.—The Youngstown Coal Co. of Indiana, has been incorporated with capital of $10,000 to engage in coal mining. The incorporators are Arthur Shelburne Robert Orme, Albert Ferguson, A. J. Orme and Charles Baker.

Shelburn, Ind.—The Shelburn Coal and Mining Co. has been incorporated for $100,000, to mine and sell coal. August H. Skoglund, Carl S. Carlson, Leonard H. Skoglund, Ernest P. Nelson and Edward Hagelin are the incorporators.

Connellsville, Penn.—S. R. Goldsmith, of Connellsville, has acquired coal properties in Preston County, West Virginia, including plant for operation, and is arranging plans for the installation of additional machinery to increase the present capacity.

Buckhannon, W. Va.—F. E. Harne, of Cumberland, has been elected president of the Buckhannon Valley Coal Co., which will shortly begin development work at Sago, the company only recently having been organized with a capital of $20,000.

Peoria, Ill.—The Urbandale Coal Co., of East Peoria, has filed a certificate with the Illinois secretary of state of an increase in capital from $5000 to $50,000. The president of the company is Isaac Kommers, Jr., of Chicago, nad the secretary H. Schradzki, of Peoria.

Morgantown, W. Va.—The Chaplin-Keener-Kerr Co. has been incorporated with a capital of $25,000 to engage in the development of coal properties in the Grant district of Monongalia County. B. M. Chaplin, J. L. Keener and Raymond E. Kerr are the incorporators.

Fayetteville, W. Va.—Fayette County is to be the seat of operations of the Herndon Coal Co. just organized. About $100,000 is to be expended by the company on the construction of a plant. Charleston men interested are C. C. Lewis, L. C. Summerfield and Angus McDonald, and Fayettsville men are C. C. Herndon and James D. Boone.

Charleston, W. Va.—Mining operations in Boone County will be conducted by the Ashford Coal & Coke Co., made up largely of Charleston business men who have capitalized the new company at $25,000. The general offices of the company will be located in Charleston. The principal figures in the new company are J. L. Johnson, W. D. Holmes, George D. Cochrane, and R. A. Stewart, of Charleston; W. C. Delaney, of St. Albans.

St. Louis, Mo.—The municipal dock at the foot of North Market St. is nearing completion, and the first sailings of the St. Louis-New Orleans fleet will be from there. An electric crane has been installed and connections made with the railroad tracks. Loading of barges will begin in a few days It is expected that with the development of the river traffic quantities of coal which have heretofore gone by the rail routes will be handled by river.

New York, N. Y.—Nearly five million dollars, or to be exact $4,367,107.55, was disbursed in pensions by the United States Steel and Carnegie Pension Fund during 1918. Of this amount $215,021.59 went to pensioners attached to the various coal companies of the corporation, the H. C. Frick Coke Co. receiving $69,442.44; Hostetter Connellsville Coke Co., $1,041.60; United States Fuel Co., $137,400, and the Tennessee Coal, Iron and Railroad Co., $7,137.55.

Heiner, Ky.—Papers have been filed with the Secretary of State of Ohio increasing the authorized capital of the Daniel Boone Coal Co. from $325,000 to $575,000. The additional capital is to be used in taking care of the opening of a new mine, known as No. 3, at Heiner. This mine was put into operation soon after the first of the year and has a capacity of 1500 tons daily, making the total capacity of the three mines approximately 3500 tons daily. The mines are located on the Louisville & Nashville Railroad.

Cleveland, Ohio—On Sept. 17, 1918, the steamer "Col. James M. Schoonmaker," of the Shenango fleet established a new high record for coal. At Huron, Ohio, she took on a cargo of 14,767 net tons and 1100 lb. for delivery at Duluth, and thus displaced her record of 14,751 tons as made Sept. 26, 1917, by a little more than 16 tons. By this performance the "Schoonmaker" now has established her sixth coal record since 1913 and has gradually increased the high-water mark in this commodity by 1039 tons during the five years.

Nashville, Tenn.—The East Laurel Mining Co., 1 Arcade, has been incorporated with a capital of $50,000 to engage in general coal-mining operations at its properties near Gernt, Tenn. It is proposed to develop about 1800 acres for initial operations, to have a capacity of 500 tons daily. The company is arranging plans for the installation of the necessary machinery including tipple screens, air punches, slope hoist, mining cars and other apparatus. John P. Williams, Jr., is president-treasurer; J. P. Pearson is vice-president, and I. F. Ligon is secretary-manager.

Buffalo, N. Y.—Delaware & Hudson coal interests will again have direct representation here by the opening of an office at 1028 Prudential Building by J. B. McMurrich, the company's representative at Oswego. His son, K. D. McMurrich, Jr., will be in charge. When the office was discontinued in 1902, the Lake trade was dropped and the state and Canadian business was divided between McMurrich at Oswego and Millspaugh & Green, of Syracuse. Mr. McMurrich has long felt that in Buffalo he would be in closer touch with his Canadian trade than at Oswego.

Charleston, W. Va.—A coal-weighing bill similar to one introduced at the last session of the Legislature has been introduced in the House of Delegates by Representative G. R. Blizzard, of Fayette County. This bill provides in brief that every person and corporation operating a mine in which ten or more men are employed shall pay miners by weight and, therefore, that all operating concerns shall have duly tested scales at their plants, the county sealer of weights and measures being required to test the scales twice a year and oftener when occasion shall require it.

Kansas City, Mo.—The Consumers Coal and Mining Co. has been organized in Kansas City by J. M. Grodzins, president; J. J. Rooney, vice president; J. R. Barber, secretary, and A. H. Rapp, treasurer. The capital stock is $250,000. The mine is at La Cygne, Kan., and coal is now being shipped. The peculiar feature of the company is that it is advertising "a way to obtain cheap coal," that way being by purchasing stock in the company. A stockholder secures a reduction of 10 per cent. on cash transactions and 5 per cent. on charge accounts. A local firm has taken the exploiting of the proposition and is advertising it extensively. The La Cygne mine is expected to produce 200 tons a day.

Birmingham, Ala.—Adams, Rowe & Norman, Inc., have announced the opening of a coal and coke sales agency, Feb. 1, with offices located on the seventh floor of the Brown-Marx Building. The new firm is composed of three of the best known and most successful men connected with the trade in this district. W. C. Adams, for the past several years sales manager for the DeBardeleben Coal Co., is president; E. J. Rowe, sales manager of the Yolande Coal and Coke Co., is vice-president and secretary; and J. A. Norman, formerly of the Bonnyman-Norman Coal Co., is vice president and treasurer. These men will sever all other business connections and devote their entire attention to the activities of the new firm, having already contracted for the distribution of the output of mines.

Charleston, W. Va.—Under the terms of a bill introduced in the State Senate by Senator Lewis of Fayette County, it is made unlawful for any coal operator or his agent to employ any one but a sober engineer or drum runner in the operation of any hoisting or lowering machinery in connection with any mine worked by shaft, slope or incline. The bill also stipulates that such an engineer shall not permit any person, unless he be specially deputized, to interfere with the operation of machinery. Intimidation of the engineer or drum runner is also forbidden by the bill. Where a mine is operated by shaft or slope not more than ten persons are to be permitted to ride in a cage or car, and where a cage or car is loaded no one is to be permitted to ride on a cage or car. It is made mandatory upon the operator where ten or more men are employed under ground to have on hand a stretcher, woollen waterproof blanket and all necessary medical requisites.

Charleston, W. Va.—Under the terms of a bill introduced in the Senate of West Virginia by Senator Morton, of Webster, it is provided that whenever the mineral or other interests in or right appurtenant to land in this state have heretofore passed or shall hereafter pass in any way from a claimant in possession of the surface of the land, the continuity of the possession of mineral interests and rights shall not be deemed thereby to have been or to be broken, but the possession of the surface by the original claimant from whom such mineral interests or rights passed or by those claiming through or under him or by virtue of a judgment against him in an action to which the holder of said mineral interests or rights was not a party sha be deemed to have been and hereafter to be the possession of such mineral interests and rights in said land for the benefit of said person, his heirs and assigns to whom said mineral interests or rights have or shall have passed as already stated.

FOREIGN MARKETS AND EXPORT NEWS

Cut in Ocean Freight Rates

On Jan. 22 the Shipping Board announced a reduction in ocean freight rates over various routes, including some special rates on commodities to Belgium. This will afford an opportunity to American manufacturers to compete on even terms with foreign industries in the race for world trade. The British and French rates have already been lowered, and it was imperative that American rates be lowered to enable the expansion of the industries of this country. The American coal industry has reached greater productive capacity than ever before, and operators must seek an outlet for their product in foreign markets or else fall back on a plan of decided curtailment. The new rate for coal from American gulf ports to Chile is $16.50 a gross ton, while coal from Hampton Roads to the Hawaiian Islands is $20 a ton.

Great Britain's Coal Exports

During the war England was forced to abandon between 5,000,000 and 6,000,000 tons of her annual coal export of about 7,000,000 tons to South America. The United States increased its coal exports to Argentina, Brazil and Uruguay from 440,000 tons in the year ending June 30, 1914, to 1,619,000 tons for the year ending June 30, 1916. Something of the magnitude of the disorganization wrought in the British coal trade by the advent of the war may be perceived by a glance at the statistics dealing with the rush of mine workers to the colors when the war began. In the first year of the war 191,170 miners enlisted and in June, 1916, the total had risen to 285,000. On the latter date the net loss of mine labor had been reduced to 133,000 men through extraordinary efforts to return soldiers to the mines, but this program was interrupted early in 1918 by the necessity of returning 75,000 miners to the battle lines.

To	1913	1914	1915	1916	1917	1918 (To Nov. 30)
France	13,014,000	12,497,000	18,281,000	18,280,000	19,283,000	16,954,000
Italy	9,906,000	8,895,000	5,947,000	5,937,000	4,435,000	3,873,000
Norway	2,335,000	2,660,000	2,824,000	2,653,000	1,192,000	1,311,000
Sweden	4,837,000	4,533,000	2,749,000	1,674,000	622,000	1,010,000
Denmark	3,102,000	3,246,000	3,297,000	2,457,000	897,000	1,007,000
Holland	1,998,000	1,732,000	1,796,000	1,347,000	381,000	76,000
Spain	2,721,000	3,259,000	2,255,000	2,141,000	836,000	465,000
Portugal	1,358,000	1,068,000	926,000	803,000	254,000	141,000
Belgium	2,245,000	1,173,000	.....	.....	.....	.....
All others	35,173,000	22,767,000	7,695,000	5,566,000	9,991,000	7,090,000
Total exports	76,689,000	61,830,000	45,770,000	41,158,000	37,801,000	31,927,000
Consumed at home	210,741,000	203,834,000	207,436,000	215,217,000	210,672,000	176,800,000
Total production	287,430,000	265,664,000	233,206,000	256,375,000	248,473,000	208,727,000

The accompanying table (see above) gives the British coal exports for the past five years. The figures are in gross tons of 2240 lb. and include coal, coke and briquets. England's export restrictions, aside from keeping within the country the necessary quantity of coal for war operations, made an effective weapon in the conduct of the war, not only in assisting her allies, but in exacting favorable terms with neutrals.

Foreign Trade in 1918

The year just closed was a record maker in foreign trade, although exports fell a shade, 1.2 per cent, behind those of 1917. December exports were only three times exceeded in previous months and years, but the year's total, $6,150,000,000, while 12 per cent. larger than in 1916, dropped $76,000,000 below 1917. Imports for 1918, which totaled $3,031,000,000, were 2.6 per cent. larger than in 1917, but still were less than half the size of the exports. Total trade in merchandise in 1918, $9,181,000,000, exceeded 1917 by only about $3,000,000. Silver exports in 1918 broke all records, totalling $253,000,000, or three times those of 1917. Gold exports were only one-ninth those of 1917, the record year, while imports were only one-eleventh of those of 1916, the peak year in this respect.

Why Great Britain Dominates the World's Coal Markets

In the foreign commerce of England coal occupies an exceedingly important place. This can readily be realized when it is known that the value of the coal exported from the United Kingdom in 1913 was no less than 8½ per cent. of all the goods exported by England that year. In fact, the British overseas trade in coal is more than twice that of the whole of the rest of the world put together.

In seeking the causes of the astonishing growth of British exports of coal during the last half century, one finds that the increase is attributable first to the growth of the demand in Europe (due to industrial activity following the settling of political difficulties) and South America, and next to the improvement in the means of transportation.

England disposes of 87 per cent., or nearly the whole of her exports of coal, to the European and Mediterranean market, ports in Belgium and to the north of Belgium taking some 26 million gross tons; the French and Mediterranean ports (including North Africa) take 30 million gross tons; South America takes well over 4 million gross tons.

Great Britain's distant markets, as a whole, are comparatively unimportant to her except to one coal field—South Wales—because of the high freights required by long voyages; it is only the high quality of the Welsh steam coal which gives it the exceptional position it occupies in foreign markets. Physically the Welsh steam coals are semi-bituminous, quite hard and durable, and capable of standing shipment well.

Another thing that favors England is the fact that her two richest coal basins—those of Wales and Newcastle—are handy to tidewater. The average railroad haul of the Welsh coal produced for export is less than 50 miles. Contrast this with our long haul to shipping points! English coal owners can load and ship their product in the most economical manner and consign the cargoes to any point overseas. Ocean conveyance, too, is cheaper in English commerce because of the tremendous amount of raw and other material she imports in her returning vessels.

Foreign Freight Rates

W. W. Battie & Co.'s coal trade freight report for Jan. 27 states:

The scarcity of orders to the West Indies still continues, and naturally but a few charters are being effected. We have numerous boats asking for such business both prompt and February loading. The South American market is very dull, owing to the scarcity of tonnage. We would quote the Chartering Committee's rates as below:

Steam—Havana, $7.50, 600 tons dis.; Cardenas or Sagua, $9, 3000 tons dis.; Cienfuegos, $9, 500 tons dis.; Caibarien, $9.50, 300 tons dis.; Guantanamo, $8.50, 500 tons fuegos, $9, 500 tons dis.; Caibarien, $9.50, 300 tons dis.; Bermuda, $9.50, and Bermuda, p. c. and dis. free, 300 tons dis.; Kingston, $9.50, 400 tons dis.; St. Thomas, $10, 500 tons dis.; St. Lucia, $11, 500 tons dis.; Santiago, $8.50, 500 tons dis.; $9, 400 tons dis.; Barbados, $11, 500 tons dis.; Port of Spain, Trinidad, $11, 500 tons dis.; Curacao, $10.50, free p. c. Curacao, 500 tons discharge.

Sail (maximum) — Para, $15.50 net; Bahia, $18.50 net; Pernambuco, $18.50 net; Rio, $19.50 net; Santos, $19.50 net; Buenos Aires, $18.50 net; La Plata, $18.50 net; Montevideo, $19.50 net. (Gross rates $1.50 per ton in excess of net rates.) On all the foregoing rates, charterers pay vessel's towage to coal port. To Nitrate Range, $16.50 gross prepaid. (Same rate steam.)

The Chartering Committee's rate by steam is $19.50 net to Rio or Santos, $18.50 net to Buenos Aires and $19.50 net to Montevideo.

Markets in Which American Coal Can Compete

If the problem of ocean freights and adequate shipping facilities can be worked out satisfactorily, the markets given in the tabulation below would be thrown open to American coals on a competitive basis. The figures given are as of 1913, before the world war disturbed the established channels of trade, and they approximate the tonnages that are imported in normal times by the respective sections named.

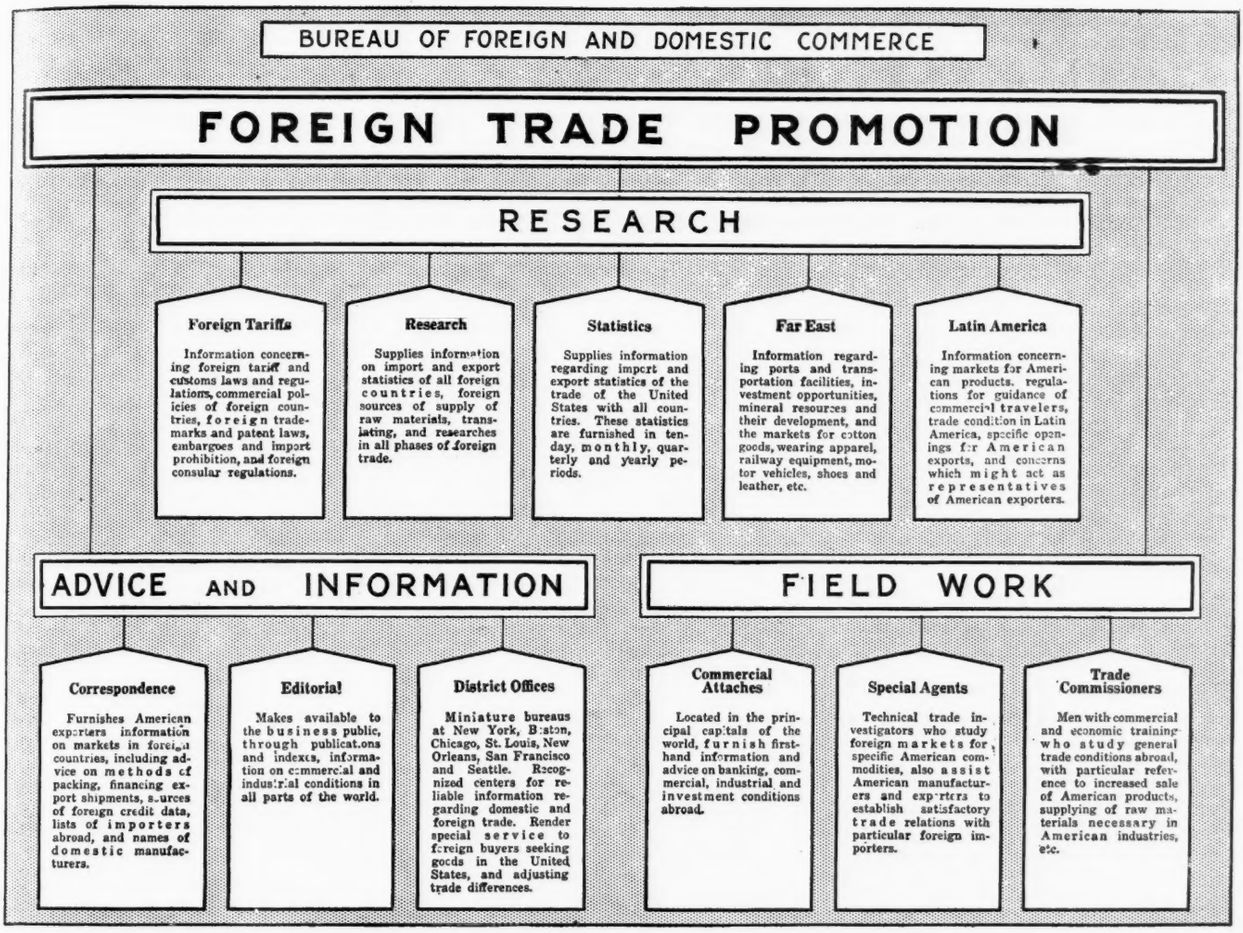
	Gross Tons
Atlantic and Mediterranean ports	35,767,749
West coast of Africa	567,037
Asia, Pacific Islands and Australia	433,062
East and west coast of North America	189,332
East coast of South America	6,334,553
West coast of South America	605,345
Bunker coal	19,161,267
Total	63,058,345

It will be perceived from the table that were the United States to enjoy a complete monopoly of the world's coal markets it would amount to about 10 per cent. of our total annual production of bituminous coal. This monopoly, of course, is impossible; and to set our cap at the South American mar-

Hampton Roads Coal Exports

NORFOLK

			Cargo	Bunkers
Lamberts Point				
1–20–19	Nor. Bk. Oaklands	Montevideo	1,464	....
1–20–19	Amer. S.S. Dallas	Rio de Janeiro	5,508	1,370
1–21–19	Amer. S.S. Calispell	Antilla, Cuba	3,039	440
1–21–19	Amer. S.S. Lake Galera	Havana, Cuba	3,005	320
1–22–19	Dan. S.S. Dania	Montevideo	3,904	1,090
1–25–19	Jap. S.S. Kirin Maru	Bremerton, Wash	3,735	900
1–25–19	Amer. S.S. Lake Medford	Barbados, B. W. I.	3,000	300
Sewalls Point				
1–22–19	Amer. S.S. Lake Beacon	Cienfuegos, Cuba	2,823	414
1–24–19	Amer. S.S. Lake Fostoria	Havana, Cuba	2,536	294
1–25–19	Amer. S.S. Goodspeed	Havana, Cuba	2,774	275
Newport News				
1–20–19	Amer. S.S. Calicorock	Havana, Cuba	3,133	302
1–21–19	Swed. S.S. Harald	Havana, Cuba	2,188	193
1–21–19	Brit. S.S. Orange River	Buenos Aires, A. R.	6,005	1,284
1–21–19	Nor. Bk. Spica	Rio de Janeiro	1,333	....
1–22–19	Nor. S.S. Munorway	Havana, Cuba	5,933	377
1–23–19	Amer. S.S. Freeman	Rio de Janeiro	4,274	888
1–24–19	Amer. Sc. Brigadier	Fort de France (Martinique)	441	....


BUREAU OF FOREIGN AND DOMESTIC COMMERCE
FOREIGN TRADE PROMOTION
RESEARCH
Foreign Tariffs
Information concerning foreign tariff and customs laws and regulations, commercial policies of foreign countries, foreign trade-marks and patent laws, embargoes and import prohibition, and foreign consular regulations.
Research
Supplies information on import and export statistics of all foreign countries, foreign sources of supply of raw materials, translating, and researches in all phases of foreign trade.
Statistics
Supplies information regarding import and export statistics of the trade of the United States with all countries. These statistics are furnished in ten-day, monthly, quarterly and yearly periods.
Far East
Information regarding ports and transportation facilities, investment opportunities, mineral resources and their development, and the markets for cotton goods, wearing apparel, railway equipment, motor vehicles, shoes and leather, etc.
Latin America
Information concerning markets for American products, regulations for guidance of commercial travelers, trade condition in Latin America, specific openings for American exports, and concerns which might act as representatives of American exporters.
ADVICE AND INFORMATION
FIELD WORK
Correspondence
Furnishes American exporters information on markets in foreign countries, including advice on methods of packing, financing export shipments, sources of foreign credit data, lists of importers abroad, and names of domestic manufacturers.
Editorial
Makes available to the business public, through publications and indexes, information on commercial and industrial conditions in all parts of the world.
District Offices
Miniature bureaus at New York, Boston, Chicago, St. Louis, New Orleans, San Francisco and Seattle. Recognized centers for reliable information regarding domestic and foreign trade. Render special service to foreign buyers seeking goods in the United States, and adjusting trade differences.
Commercial Attaches
Located in the principal capitals of the world, furnish first-hand information and advice on banking, commercial, industrial and investment conditions abroad.
Special Agents
Technical trade investigators who study foreign markets for specific American commodities, also assist American manufacturers and exporters to establish satisfactory trade relations with particular foreign importers.
Trade Commissioners
Men with commercial and economic training who study general trade conditions abroad, with particular reference to increased sale of American products, supplying of raw materials necessary in American industries, etc.

How the Government Will Help Solve Your Export Problems

COAL operators who are desirous of obtaining more definite information regarding the extensive plans of the Department of Commerce in relation to the expansion of our foreign trade can avail themselves of the vast fund of knowledge possessed by our own Government agencies. The possibilities of the application to industry of the organization created by Secretary William C. Redfield of the Department of Commerce is shown in the diagram. From reports of the various trade commissioners now returning to this country it is felt that the work of the Department should be of infinite value to those who are seeking foreign markets. Aside from the information given in the chart, there is being issued a monthly index on statistics pertaining to specific articles of import and export, as well as general information on markets for given products. Application for information regarding export business should be addressed to the Bureau of Foreign and Domestic Commerce, Washington, D. C.

kets alone would mean an outlet for little more than 1 per cent. of our annual output. Everything being equal, England's hold on the European market cannot be broken; but at the present time Great Britain is experiencing considerable difficulty with her coal miners, and her output has fallen off to an abnormal extent. Herein lies America's opportunity. Whether we succeed in retaining permanently the foreign markets that we will assuredly enter in the near future is problematical. There will be every advantage in England's favor when the world once again settles down to normal. In the event that we should succeed temporarily or permanently in entering foreign coal markets, it is a foregone conclusion that grades equal to New River and Pocahontas would enjoy the bulk of the export trade, as these coals not only possess characteristics that should find favor with foreign consumers, but they can be advantageously transported to tidewater. The State of West Virginia alone, with an output of more than 97,000,000 short tons of soft coal in 1918, could more than take care of the entire world's fuel markets.

Canadian Ocean Rates

The freight rate on steamships plying regularly between Canada and the British Isles has dropped to $1.50 a cubic foot, it was announced in Montreal on Jan. 23. Canadian shippers say that vessel space will soon be seeking cargoes, thus reversing the conditions which have prevailed for four years. The rate before the war was 30 cents a cubic foot.

Coal Shortage in England

To relieve the shortage Great Britain is turning attention to the potential coal resources of Ireland. Operations are about to be commenced in County Tyrone and borings will be made at Coalisland and in the district between there and Lough Neagh. Lignite abounds in the region and its utilization is to be undertaken at once. It is to be stripped from its bed by rotary cutters and made into briquets by a secret process, which is said to make lignite a good coal substitute. Machinery already installed will be capable of producing 15,000 tons of briquets weekly.

Coal Needs of France

Considerable discussion is prevalent in French circles as to the position of France with respect to her future coal supplies. The suggestion has been made that Germany should supply France with some millions of tons of coal, to be set off against indemnities and as compensation for the havoc wrought by Germany on French territory.

France, in normal times, imports about 23,000,000 tons of coal annually. In the future she expects to eliminate the necessity of importing coal by the exploitation of the coal beds which she will claim from Germany as being part of her own territory, and which she looks forward to as eventually coming within her own borders. Not only has France advanced the claim that Lorraine rightfully belongs to her, but she also states that the new boundaries should include the region of the Saar.

If France succeeds in gaining her demands, about 18,000,000 tons of the 23,000,000 tons she now imports annually would be available. This, in turn, would have a far-reaching effect on the coal trade of England, for France is Great Britain's largest customer for coal. It would seem that not only would the French market be considerably restricted so far as British coals are concerned, but that plans (or visions) of a large export of American coals to France will suffer quite some modification.

German Coal Situation

For the present the coal situation throughout Germany is so threatening that all other questions are overshadowed. The daily production in the Ruhr district is less than 10,000 tons, against 24,000 tons during the war and 33,000 tons in peace times. Upper Silesia is producing 2000 carloads daily, against 11,000 carloads in war times and 14,000 carloads under peace conditions. The reserve supplies of coal in the hands of consumers are virtually exhausted.

As a result of the coal shortage large factories in many German cities are already closed down, and it is thought that a number of the biggest plants in Berlin will have to suspend operations if the situation does not improve soon.

The lack of sufficient rolling stock to transport even the comparatively small quantity of coal being mined further aggravates the situation. Labor conditions, too, have served to complicate matters. A strike epidemic is prevalent in the coal districts, and it is impossible to get enough workers at the mines.

MARKET DEPARTMENT

Weekly Review

Bituminous Production Falling Off Through Lack of Demand—Prices Lowered on Some Grades of Soft Coal—Operators Investigate Foreign Markets—Anthracite Mines Curtail Operation—Impending Labor Troubles.

NO ONE seems to worry much about production statistics these days, though as a matter of record it should be stated that the output of soft coal has fallen considerably below current consumption. An overstocked market, poor weather conditions (from the operator's and dealer's viewpoint) and the elimination of all control by the Fuel Administration are a combination of demoralizing circumstances from which the coal industry can expect no immediate relief.

It is still too early to judge of the full effects an uncontrolled competitive market will have on coal prices. If the statements of a number of prominent bituminous operators can be taken to mean anything, however, the nation will witness the closing down of many mines sooner than a reduction in the price of coal that will force them to operate at a loss. This is not to be taken to mean that the last ruling Government maximums are being adhered to as standard. In fact, reports of cuts in prices and offerings at considerable reductions below former figures are common, though in the majority of cases this is true only of the medium- and low-grade coals.

In the hope that it will enable them to furnish an outlet for the full productive capacity of their mines, many soft coal operators are investigating the opportunities and possibilities afforded by foreign markets. England, to which the European continent and South America had formerly looked for their fuel supply, now finds itself hard put to it to meet her coal obligations. Labor troubles and a multiplicity of other social and political ailments have served to hamper British coal output to an abnormal extent; and it is not at all improbable that if the Federal Government comes to the aid of American coal producers by establishing ocean shipping rates that will enable successful competition with English shipping, the United States will gain a worthwhile hold on the foreign coal markets.

At home no improvement in the demand for soft coal is expected until well along in the spring. Even then much depends on the manner in which industry in general resumes activity. The railroads, the largest consumers of coal in the country, have stopped making requisitions on the mines, and the national association of bituminous operators has made concrete proposals to Director General Hines looking to a speedy settlement of the vexing question of railroad fuel prices. No decision has been made as yet, though Mr. Hines promises to devote his attention to the matter after he gets through with his hearings before the Interstate Commerce Committee of the Senate.

Operators, as a rule, are optimistic regarding the future, believing that once the political situation in Europe is cleared the long pent-up flood of orders for a vast quantity of material will be let loose, and that the United States will come in for a goodly part of the new world's business.

The anthracite end of the coal industry was surprised on Jan. 31 by Dr. Garfield's announcement that all prices and restrictions on hard coal were to be removed, effective Feb. 1. In concrete, this means that Government supervision of the entire coal industry is now a thing of the past. Control is unnecessary, for there is little if any demand for any grade of anthracite coal. It is becoming more and more difficult for the anthracite mines to dispose of their output. A number of collieries have shut down completely, while many others are working only three and four days a week. So listless is the demand for hard coal that the railroads have ceased the movement of coal trains on Sundays. Offerings of steam sizes of anthracite have been made at marked reductions from the so-called Government prices, but these have met with exceedingly little buying response.

To put the matter concisely, the market activity in both hard and soft coal is conspicuous by its absence, with a consequent slowing down of operation at the mines. That this will have a bad effect on mine labor is almost a foregone conclusion; already the murmurings of discontent grow louder and louder. Only the active resumption of industry on a large scale will ward off impending labor troubles in this country. Preachments and admonishments to sit still and "not rock the boat" are of no avail whatsoever. Only real, live tangible work will give employment to thousands now unemployed. When the country is busy, and then only, will our coal mines be called on to operate at top-notch efficiency.

WEEKLY COAL PRODUCTION

A considerable decrease occurred in production of bituminous coal during the week ended Jan. 25, the output declining to the low level of 9,159,000 net tons. This production, which falls approximately three quarters of a million net tons below the preceding week, and approximately one million net tons below the corresponding week of last year, is at the rate of 475,000,000 net tons per annum and is considerably below present consumption. Many consumers are now using coal accumulated during last summer and the present good weather enables certain consumers to await the outcome of the raising of the zone and price restrictions by the U. S. Fuel Administration before placing their orders.

The daily production of bituminous coal during the current week, estimated at 1,526,000 net tons, is below the daily average for the coal year to date and behind the daily average for the same period of last year. The total production for the period Apr. 1 to Jan. 25 is now estimated at 485,656,000 net tons and is 34,855,000 net tons in excess of last year's production for the same period.

The production of anthracite increased considerably during the week ended Jan. 25, and was slightly in excess of the average weekly production for the coal year to date. Preliminary estimates place production of anthracite for the current week at 1,886,000 net tons as against 1,786,000 net tons during the week of Jan. 18, and as against 1,719,000 net tons during the week of Jan. 25, 1918. The daily average during the current week, estimated at 314,000 net tons, is a slight increase over the daily average for the coal year to date, and but 3000 net tons behind the daily average for a similar period of last year.

Carriers' reports show a decrease in cars loaded in all districts compared with the preceding week, with the exception of Alabama, where the increase was slight. Material decreases occurred in western Pennsylvania (800 cars), in Ohio (2800 cars) and the district including Illinois, Indiana and Western Kentucky (5300 cars).

New England Shipments—Bituminous coal shipments to New England, during the wek ended Jan. 25, are estimated at 344,112 net tons, an increase of approximately 33,000 net tons, over the shipments of the week preceding. This improvement occurred entirely in the receipts through the rail gateways, the increase in this tonnage for the week amounting to approximately 44,000 net tons, over the week of Jan. 18. Tidewater shipments declined during the week approximately 11,000 net tons, and was brought about chiefly by the low tonnage loaded at Baltimore.

Tidewater Shipments—Shipments of bituminous coal from Atlantic harbors for the week ended Jan. 25 amounted to 683,994 net tons, and, as in the case of New England, tidewater shipments fell slightly below the performance of the week of Jan. 18. Shipments from New York and Philadelphia were in excess of the preceding week, while shipments from Baltimore and Hampton Roads fell considerably behind.

Beehive Coke—Production of beehive coke for the week ended Jan. 25 is estimated at 575,000 net tons, an increase of 18,000 net tons over the week preceding, and 75,000 net tons over the same week of 1918. The average production per working day for the current week is estimated at 96,000 net tons as compared with 83,000 net tons during the week of Jan. 25 of last year. The

operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production at 280,767 net tons of beehive coke and the operation of their plants at 74.6 per cent. of their full time as compared with 76 per cent. during the week of Jan. 18. Considerable improvement occurred in labor conditions during the week. The same operators produced 163,650 net tons of coal.

Byproduct Coke—Byproduct coke production in the United States for the week ended Jan. 25 is reported at 558,876 net tons as compared with 559,298 net tons during the week ended Jan. 18, and 366,208 net tons during the corresponding week of 1918. During the current week the ovens of the country were operated at 84.6 per cent. of their full time, operating conditions remaining approximately the same as the week preceding. Loss of capacity attributed to lack of market increased slightly in Massachusetts and Minnesota. In the former state approximately one-half of the capacity is now lost on account of this lack of business.

BUSINESS OPINIONS

The Iron Trade Review—The industry is being obliged to make further curtailment of operations to square itself with the light volume of buying. A canvass of the pig iron situation shows that at the present time thirty-nine active stacks with an estimated daily capacity of 15,000 to 20,000 tons, have been blown out or banked, most of these since Jan. 1. Mill activities are not far from 60 per cent. on the average. The best showing appears to be in plates, sheets and merchant mill products.

Bradstreet's—Wholesale and jobbing trade is still at a waiting stage. Retail trade is less active, and the industrial pace, particularly in textile and iron and steel lines, is slower. Even collections are rather more tardy, and the number of unemployed is officially reported larger, this being confirmed by the advices of reduced active mill, blast furnace, and mine capacity from a number of points, of old orders running out, and of munition works turning over capacity to peace lines.

Dry Goods Economist—From most sections of the country come reports of good business despite the unseasonable weather, a falling market and a probability of strikes in some centers. Retailers are steadily reducing stocks. As a rule they are buying a little more freely than of late, but conservatism is the rule, except where manufacturers guarantee to maintain their prices for a definite period. The attitude of labor in textile and garment manufacturing plants is probably the most disquieting feature of the week's business.

The Iron Age—Export inquiry is awakened by the sharp cuts given to ocean freight rates on both sides of the Atlantic. The disparity of British and American charges has not been materially reduced but the change is sufficient to cause concern abroad, particularly over the possibility of United States steel and iron being imported to the exclusion of the home product. Some thousand-ton lots of finished steel for England are now in storage here awaiting favorable vessel rates, and stocks there made at high costs are not yet liquidated. In open competition an American mill has sold tin plates to Japan. The British fixed price is $43 a ton higher than the Pittsburgh quotation, and a less freight differential is all that is necessary to throw the business to the United States on a price basis.

Atlantic Seaboard

BOSTON

No significant developments. Continued anxiety on part of shippers over tidewater situation. Coastwise movement extremely light, especially of steam grades. Increase all-rail due to high rates by water. Gas coals also show better receipts. Railroads taking clean-up shipments on old contracts. Operators try to induce buying, but market unresponsive. Several Hampton Roads shippers practically without orders. More steamers tied up. Railroad supply comes forward in barges from New York at lower rates. Boston retailers reduce steam prices. Anthracite receipts show increase all-rail. Cancellations now the order of the day. Current deliveries at retail much reduced.

Bituminous—The market is at a standstill. Removal by the fuel authorities of all restrictions as to price and movement seems to have no appreciable effect on the current situation. Certain of the higher grade coals from central Pennsylvania are still being sold in a very limited way at the recent Government figure, but the inferior grades on the other hand can hardly be disposed of as a gift. As low as $2.25 f.o.b. mines per net ton has been heard, but it is not believed that any considerable tonnage can be placed even on that low level. The attitude of interests here who control mines is to sell what the market will absorb at a fair figure and then shut down until conditions improve. It is of course true that a large number of small operators who were able to make shipments last year now find mining too expensive, and in this way a fairly considerable tonnage will be lost this season. From present indications, however, it will not be missed, for New England consumers are still loaded up to the risers with coal taken during the scare last season.

The wide differential between rail and water delivery throughout this territory continues a source of great anxiety, especially to shippers from the Southern ports. The present decline in prices of the Pennsylvania coals is all the more disturbing, and all hands seem powerless to provide a remedy. In Boston today, in what is normally a market almost exclusively for Hampton Roads coals, a large proportion of Pennsylvania coal is now being used, and bought through channels other than the regular retail distributors. This is purely because of the great difference of price, and it is in recognition of this situation that Boston retailers who deal in Pocahontas and New River have already reduced prices, in some cases $1 a ton. There have been rumors that the Railroad Administration would be asked to advance all-rail rates as a remedy, and strange as it may seem something may be carried through on this line. It is at least in line with current enconomic theory.

Receipts by water of all the steam grades are extremely light. Little coal is being shipped from Baltimore for this territory, and dumpings at the Virginia piers have also been reduced to a minimum. A large number of mines have been embargoed because of failure to dump coal at the shipping port, idle operations are increasing in number from week to week. Deliveries inland on contract are limited to only a few cars daily, even from points like Providence, Boston and Portland, and with high-grade Pennsylvania grades open to the few buyers who are in the market it is easy to seen why they are not enthusiastic over paying premiums of $2@$2.50 for Pocahontas and New River.

Strenuous efforts are still being made by operating interests to induce buying in New England, but steam users are likely to continue unresponsive for a long time to come. Talk about possible labor difficulties and shutdowns fails to budge them, and with all the textile mills practically on a five-hour daily basis, it can readily be seen that present stocks will serve for a good many weeks beyond what was estimated last fall.

There are several Hampton Roads agencies that are practically without orders. Groups of mines are shut down until coal now accumulated at the Norfolk and Newport News piers is moved. Prices have shaded quite radically, one quotation being rumored at $2.25 for New River as compared with $2.70, the recent maximum. One or two shippers are venturesome enough to send coal forward "on the market," but recent experiences are not at all encouraging. Conferences are being held, but no solution has yet been reported.

The number of steamers tied up because of the lack of orders is steadily increasing. Steam colliers supplied to shippers in place of bottoms requisitioned last year for overseas are also being tied up at the expense of the party holding the charter, and meanwhile the Shipping Board gives no intimation of a possible change in rates. The ocean freighting situation has been somewhat cleared up during the week, but no further announcement has been made of any interest to coastwise shippers. One of the sidelights on this peculiar situation is the extent to which railroad-owned barge transportation is being used to freight railroad fuel to the eastern railroads. At current rates this transportation costs the railroads something like $1 less per ton than Shipping Board steamers, aside from the heavy demurrage clauses that apply to the latter, and a considerable tonnage has come forward in this way that would otherwise be freighted in steamers.

The Boston retail dealers reduced the price of bituminous in teams to $9.25 per net ton, this being a drop of $1 from the price that prevailed all winter.

Anthracite—Receipts of domestic sizes continue to show an increase all-rail. For the last eight days of January the average daily movement was 511 cars, a figure that had not been reached for some months. By water, too, shipments are in much better volume. Recent cargoes show an increasing proportion of stove and chestnut, now that the demand for these sizes is easing up from the big city markets.

Retail demand throughout New England is much reduced. In many cases deliveries to consumers were only about one-third of what had been estimated for January, and, as has so often been the case, just at the time when the shippers are in position to furnish what the trade has been howling for during the months past, orders are melting away like snow in July. Cancellations are now the order of the day in every direction, and we are in for a dull spell in anthracite as well as in bituminous.

NEW YORK

Removal of restrictions fails to affect local market. Plenty of coal available. Demand slow and dealers are not willing to place new orders. Independent coals quoted below company schedule. Anthracite steam coals in oversupply. Bituminous in good supply with demand slow and prices easy. New demurrage rules go into effect. Bunkering slow due to diversion of vessels to other ports. No immediate improvement expected.

Anthracite—Receipts of domestic sizes strictions on maximum prices of anthracite had little effect on the local situation. The announcement, which came as a surprise, had been anticipated for the past few weeks, but it was thought it would not be forthcoming until the middle of February at the earliest. Coming as it did at a time when coal is plentiful and demand slow, it did not affect market conditions.

The trade has been marking time. Weather conditions during January were anything but suitable for a heavy consumption of coal. Its accumulation has been such that producers and distributors have been receiving nearly as many cancellations as new orders, and consequently shipments from the local tidewater docks have been slow. Deliveries to inland dealers have improved considerably, these dealers having much better facilities for storing coal than the New York dealer has. These conditions are reflected in the report of cars dumped here during the week ended Jan. 31. For that period 4569 cars of anthracite were dumped as compared with 6558 cars the previous week, a decrease of 1989 cars. During the first month of the year 23,756 cars were dumped as compared with 26,261 cars in December, a decrease of 2505 cars.

The lack of demand is reflected in production, many of the mines being idle, and others having their working hours reduced. Reports received here are to the effect that most producers are storing the smaller sizes.

There is no desire on the part of dealers here to stock up. Most all have their coal pockets filled, and even with cold weather would have enough to meet all requirements for several weeks. Instead of the buyer seeking the seller conditions are the reverse, and in some instances inducements have been offered to move the coal. Quotations show many variations. Independent product has for several weeks been quoted at company or lower prices. All domestic sizes, including pea coal, are plentiful.

The steam sizes are on the toboggan. Little headway is being made to reduce stocks, and considerable storing is being done. Buyers are being favored with heavy concessions, but there is no demand.

Dr. Garfield's order resulted in a reduction in the retail prices of coal in Manhattan and the Bronx. Domestic coals, including pea coal, were reduced an average of 25c. per ton and steam sizes 35c. per ton, the change taking effect Feb. 3.

Delos W. Cooke, State Fuel Administrator, issued an order that the removal of the restrictions did not affect the regulations governing the sale and distribution of coal in less than half-ton lots in the City and State of New York, and that for the rest of the winter the price of coal in less than half-ton lots shall not exceed 60c. a hundred pounds at the cellar, when called for, and 70c. when delivered. Wagon venders and other peddlers must sell at the same prices. At retail dealers' yards the price is 55c. a hundred pounds on the cash-and-carry basis. In all other parts of the state existing rules as to the price and distribution of coal in less than half-ton lots shall continue in force until further orders.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$7.80	$8.55
Egg	7.70	8.45
Stove	7.95	8.70
Chestnut	8.05	8.80
Pea	6.55	7.30
Buck	5.10@6.05	5.90@6.25
Rice	4.65	5.10
Barley	4.15	4.30
Boiler	4.60	

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates. Prices for buckwheat, rice, barley and boiler are not fixed by the Government.

Bituminous—No immediate change in local conditions is anticipated as a result of the suspension of price and zone regulations on Feb. 1. The trade was notified on Jan. 17 that the Government would relinquish supervision of the industry, and it was prepared to adjust itself to the new conditions should it have been necessary. For several weeks past it has been well nigh impossible to obtain the Government maximum prices for almost any grade of coal unless it was of the very highest quality, and the fair and cheaper grades have been offered at prices considerably below the Government figure.

The situation has resolved itself into one of supply and demand. Conditions have not been favorable for coal consumption and most manufacturers are well stocked. In addition most textile factories have cut down their hours of operation, which in itself has considerably lessened consumption.

Operators and shippers are striving to land orders for immediate delivery, but their success is small. Consumers in the main are filled up and nothing save big inducements could make them add to their stocks. Indeed indications are that notwithstanding predictions of increased prices for certain grades it will be possible to buy at lower prices than present quotations before May 1. Hardly any shipper expects improvement before June 1.

Bunkering of vessels has slowed up due in part to the diverting of many bottoms to other ports. This has caused an easing in prices for high-grade coals.

Little attention is being paid to the making of contracts. As most of the consumers expect cheaper coal in the spring they are not anxious to sign up for next year's supply at anything like the present quotations. Some selling agents believe that contracts will not be signed up until June.

The new method of apportioning demurrage charges went into effect on Feb. 1. This method contemplates the charging of demurrage against those shippers to the pools on whose coals the charges have accrued after giving them the benefits of credits earned by those who have moved their coal in less than the free time.

The dumpings of bituminous coal at the local tidewater docks for the week ended Jan. 31 were 6187 cars as compared with 6103 cars the previous week, a decrease of 84 cars. For the month of January the dumpings amounted to 23,769 cars as compared with 25,169 cars in December, a decrease of 1400 cars.

Current quotations, based on Government prices at the mines, per net ton f.o.b. tidewater, at the lower ports, are as follows:

	Mine, Gross	F.o.b. N. Y., Gross
Central Pennsylvania:		
Mine-Run, prepared or slack	$3.30	$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of-Mine	3.08	5.23
Prepared	3.36	5.51
Slack	2.80	4.95

Quotations at the upper ports are 5c. higher.

PHILADELPHIA

No improvement in market conditions. All dealers carrying comfortable stocks of all the domestic sizes. Shippers continue to receive requests to suspend shipments. Practically no egg and pea coming here. Some individual coal being offered at company circular with few buyers. Steam sizes weak and causing much concern.

Anthracite—Conditions in both the wholesale and retail trade do not improve as the season advances, because the unseasonable weather does not warrant the forcing of fires for the consumption of family sizes. Owing to the unsettled condition of many of the industries, the steam coal market is demoralized, due to overproduction and the large stocks on hand.

The yards are comfortably fixed, and the dealers cannot believe they will not be emptied before spring. They are now ignoring the unfilled orders on their books, and are only making the deliveries when called upon. It is a satisfaction to note that so far they are holding the domestic market together, and while they are doing considerable advertising are not cutting prices. It will be remembered that their present gross margin of profit was not granted them by Mr. Lewis until he had the books of all the representative dealers examined by expert accountants. To cut into this now would not only be a reflection on the office of the local fuel administration, but would show that the dealers were insincere when they claimed they could not remain in business unless it was granted them.

It is plain that the individual operators are in a far more serious quandary than the dealers they supply. After the successful fights they waged in Washington to obtain, and retain, the differential allowed them by Dr. Garfield, it is not to be supposed they can now gracefully absorb it, even if their mining expenses warrant it.

We have it, however, on high authority, that there is some price-cutting among the smaller operators. At this writing, the practice is not at all general, and we are satisfied that where prices have been reduced it has brought little or no new business. The largest buyers in the city report having bought no coal from the individuals at company circular, and insinuate, that prices being equal, the big companies will receive the orders for any coal they may require between now and spring.

Restriction of production seems to be the only solution. The dealers have been paying their bills promptly because they have been quickly turning their coal into cash. Now, to persuade the trade to buy, when they are selling little, is to encourage longer credits. The retailers freely admit that where they are asking their customers to store more coal they are not receiving the money for it. It would not take long to have the buyer and the seller drop back into old habits, and this the wiser heads are anxious to avoid.

Shippers report that more dealers held their orders this week. By now there is practically no egg and little pea coal coming here. Whatever business remains is on stove and chestnut, but there are few yards without a supply of all sizes. Several dealers report selling horses this week, at a sacrifice by the way, and while in other years they have always dreaded snow, we have heard several express the wish for any change in the weather that will bring business.

The steam sizes show no improvement whatever, and we hear of buckwheat being offered around $3. There seems almost no demand for the smaller sizes, and the prices are correspondingly low. The companies continue to stock these small sizes.

BALTIMORE

Coal trade, back on a strictly competitive basis, finds new problems. Oversupply of soft coal here. Anthracite easy and demand light.

Bituminous—Many new problems—or old before-the-war problems in new dress—are facing the coal trade here in these days when the removal of Government restrictions has thrown business back on a strictly competitive basis. In the first place there is an oversupply of soft coal in this territory. Some hope is held out for the ready absorption of that part of the coal that can be classed as of better grade; but there is a tough road ahead for the other kind.

The demand that exists now is discriminatory. Jobbers, urged by mine connections, are working hard to convince consumers that now is a favorable purchasing season. This move, it must be admitted, has not been universally successful. Meanwhile there come reports of additional mine closings to await a more favorable market. Some mining sections have entered into a sharp competition.

Some days ago there were reports that Fairmont ¾ in. was offering as low as $2.40 to $2.50, as against the old Government maximum of $2.75, with little or no call at all for run-of-mine, which was a quarter less under the late Government figures. Freeport coals were also quoted as low, although the general run was a little better, a decided cut from the old figure of $2.75 as set by the Government. Then Pennsylvania coals entered into active competition, and in some cases fuels that had held at $2.95 maximum were offered at $2.75 and, in fact, less at times. These figures were too near production cost or below, and did not suit some operations, which have closed as a result. The trade feels that the congested market will gradually clear up and that then a better price will be maintained.

Anthracite—The demand remains light for anthracite in the face of the unseasonably warm weather. Dealers will be a little cautious in purchasing between now and spring, with cash costs undoubtedly at maximum. Few are willing to run the risk of being caught with any considerable reserves should a cut come in the wholesale rate. The supply here at present is more than adequate, and the only complaint heard is in regard to the light run of chestnut.

Lake Markets

PITTSBURGH

Sharp curtailment in production. Advanced prices announced. Coöperation of miners.

On the occasion of the relinquishment of price control by the Fuel Administration Pittsburgh district coal operators put out the following prices: Slack, $2.35; mine-run, $2.50; ¾-in., $2.60; 1¼-in., $2.75, per net ton at mine, Pittsburgh district. Government prices, which expired Jan. 31, were: Slack, $2.10; mine-run, $2.35; screened, $2.60. Thus mine-run is advanced 15c. A fact of prime importance is that about 70 per cent. of the mine capacity of the district is shut down. That is the form of expression, rather than that the capacity is merely idle.

On behalf of the operators it is asserted that some have been producing coal at a loss, selling at Government limits, and that under Fuel Administration regulations the Pittspurgh district was given a lower price, relative to cost of production, than almost any other coal-producing district in the country. It is asserted that some districts were given prices that were notoriously high, simply for the purpose of stimulating production, while the Pittsburgh district did not need, or at least was not active, in demanding at Washington, such an incentive.

Close relations are stated to exist between operators and miners in the district. The miners have large funds, which in an emergency they could use against the operators in a contest against wage reduction, but which they are quite ready to use in coöperation with the operators in an effort to secure a good price for coal, with such mine idleness meanwhile as is necessary to produce the desired results.

The market is not fully developed as yet, but it appears that standard grades of gas coal are selling at the adopted prices, as noted above. As to steam coal, there is no demand, and it is said that there are no sales of importance at lower prices, though cuts to the former Government price of $2.35 for mine-run may easily occur. For the time being the market seems quotable at the announced prices, based on $2.50 for mine-run, and gas coal may be regarded as steady at that figure.

BUFFALO

Market still exceedingly dull. Not much prospect of early improvement. Mines shutting down to reduce surplus. More anthracite as weather remains mild.

Bituminous—The dullness continues. Consumers will not buy to any great extent, for they have large supplies on hand. A Buffalo jobber sent out a salesman lately to sound the trade, but every card report sent in noted large stocks everywhere. Not a consumer visited was in need of coal, and nobody would buy.

At the same time the feeling, at least so far as the operators are concerned, is more confident than it was, for they believe they can reduce production enough to hold the prices substantially where they are. Occasionally a cut price comes in, but it is declared that the Pittsburgh price is absolutely firm and can be held after the Government control is dropped. There has been more doubt as to the chances of holding the Allegheny Valley price, for the price is not only higher, but the coal is hardly as popular as Pittsburgh and cannot be used as generally as a rule. The jobber with no close mining connection is hit hardest, for he will get no concession and his ability to find consumers who need coal is small.

Anthracite—The mild weather has added another snowless and almost frostless week, which means that anthracite is in greater

supply than the demand. Some distributors say that a sudden cold snap would be likely to send every consumer with a small supply looking for an immediate filling of his order, but no one is afraid.

The prospect of a surplus of anthracite is so good that shippers have in one or two cases made some inquiries about lake tonnage; but they have gone no further. They say that if the winter continues mild another month they will have coal to load into vessels, and maybe before that, but nobody really looks for a frostless February.

Reports from Canada agree that the surplus of all sorts of fuel except anthracite is still large, and it may turn out that there is enough of that, in which case the dealers will have a large quantity of miscellaneous stuff to carry over, for the demand for bituminous is smaller than it is here.

CLEVELAND

No. 8 operators are showing more backbone and conversationally, at least, are adhering to Government prices. The tearing down of Government barriers has not yet affected the market, though many expressions are heard that price reductions all around are inevitable not later than Apr. 1. Lake coal shippers have agreed with upper dockmen that the Great Lakes coal pool must be abandoned, and are seeking the Railroad Administration's aid in making this possible.

Bituminous—With the closing down of more mines in southern and eastern Ohio, the surplus of bituminous has become less apparent. Consequently, operators are talking once more of the proposition that price cutting will not serve to increase demand, hence the futility of asking less than the Government price. Such talk, however, is confined to the larger operators, who are well backed by contracts. Scarcely a day passes that a job lot is not offered at a marked concession to move it in a hurry, to keep a step ahead of car service, or that some No. 8 operator is not willing to let go of a small tonnage for 25c. or so under the maximum. All that is necessary to buy steam coal under the Government maximums is to "shop" for it.

One peculiarity of the present situation is that there is next to no demand for slack, making the coarser grades scarce in proportion. Usually, the reverse is the situation. Retail dealers especially are being besieged with "bargain lots," which, however, the larger dealers seem averse to taking on because of the difficulty of explaining the old price when the job lot has been disposed of. The steam coal market is feeling no effects of the dropping of all Government restrictions. The retail market is expected to be shaken up about the middle of February, when shipments of Pocahontas are due. The coming of cold weather has not spurred the retail market greatly, while more and more industrials are tapering off operations. The net result is that the bituminous market daily is becoming more slack. Only the feeling that they should preserve an optimistic outlook prevents the larger operators from using the adjective "stagnant" in its fullest force.

Anthracite—Dealers continue to compete for anthracite business. Some of the larger retailers are long on furnace grades, which seem much more plentiful than stove sizes. Anthracite shipments continue to increase, but demand is stationary because of the absence of real winter weather.

Lake Trade—As forecast, the final word concerning the Great Lakes coal pool, which in the 1918 season was conducted by the Ore and Coal Exchange, Cleveland, of which Herman M. Griggs was manager, is to be said by the United States Railroad Administration. Meeting in Cleveland, upper lake dock operators and lake shippers agreed that the pool, must not be continued in 1919. From an operating standpoint the pool has proved 100 per cent., but the mixing of coals is too great an evil to be tolerated again—was the unanimous opinion. Individual sales and shipping should be restored at the earliest moment possible, was the sense of resolutions adopted. The one stumbling block is excessive demurrage. Formerly, shippers were granted 5 days' free time at lower lake docks, with demurrage $1 a day thereafter. Now, however, only 3 days' free time is allowed, and the demurrage beginning with the fourth day is $3 a day.

DETROIT

Termination of zone rules and Government price control of bituminous coal creates a rather unsettled market, with fear that some operators may make Detroit a dumping ground.

Bituminous—With heavy stocks of bituminous coal in reserve piles of most of the large steam plants, and filling the storage yards of the greater number of retail dealers, the ending of the Federal Fuel Administration's zone restrictions and removal of Government price control are productive of considerable uncertainty among the coal trade in Detroit. There is a feeling, however, among jobbers and wholesalers that the restoration of an open market on bituminous is not likely to be productive of any immediate increase in their volume of sales in Detroit. Some of the jobbers anticipate that the lifting of the zone rules will enable them to move considerable coal into points in Indiana, which were inaccessible under the Government limitations.

Among the retail dealers there is just now more of a desire to cut down present stocks than to bring more coal into Detroit. Their attitude is caused by the fact that a large proportion of the stock on hand is of low quality, and a good deal of it in the shape of mine-run or other forms of bituminous that are not regarded as desirable fuel for household use. The coal was purchased by the retailers when predictions of an impending shortage were being circulated, followed by bulletins from the Fuel Administration urging that any coal be taken to assure an adequate supply for household consumers.

With the better grade of coal from West Virginia and Ohio mines now to be had, there is some anxiety lest operators in those districts, in their eagerness to sell coal, use Detroit as the dumping place for speculative consignments. Such shipments coming into competition with the stock already here, it is feared, might produce disastrous results for many of the retailers, who, because of the unusually mild weather this winter have made little progress in clearing their yards.

Anthracite—Not much anthracite is being received, and some of the dealers are not putting forth very strong efforts to increase the supply as they realize that customers who are now being supplied with bituminous likely would insist on getting anthracite. The plentiful supply of coke is taking the place of anthracite with many householders.

COLUMBUS

Weakness still characterizes the coal trade in Ohio. Warm weather is retarding domestic demand, while steam demand is held down by extra large stocks in reserve. Prices are cut to a certain extent.

The coal trade is still weak. The continued warm weather has caused a lull in domestic demand. In fact it now appears that much coal will be carried over by householders, and that will affect the trade next summer and fall. Another point brought out is the fact that many consumers stocked up on an inferior grade of coal, which is causing some trouble. Thus consumers will be slow to buy until rather late in the season. Retail prices are pretty generally maintained, as dealers are still selling high-priced coal. Some instances of cutting are reported, but these are not sufficient to demoralize the market. Pocahontas is still in good demand, but other grades are not wanted in large quantities. Retail stocks are still large. The lifting of the zone restriction will mean a general movement of Pocahontas to northern Ohio points, from which section it was held away by Government restrictions.

The steam business is dull. Stocks are still large, and since large consumers are rather slow in getting on a peace basis, there is little demand expected before April. Rubber plants are well supplied, and the same is true of iron and steel factories. Public institutions have sufficient tonnage for some time to come. Purchasing agents are following the policy of waiting until their stocks are consumed. Railroads are only buying a small percentage of former requisitions and are still bearing down prices wherever possible. Many mines producing steam grades exclusively have been closed down indefinitely.

CINCINNATI

Demand remains dull in all departments of the market. Removal of zoning restrictions will not immediately stimulate business, as shipments West are not regarded as advisable.

There has been no change in the state of the market during the past week or so, and there is at present no indication that there will be any change for some time to come. The dominating factor in the situation remains the fact that coal in storage is of much larger volume than usual, and with the winter nearing its end and comparatively mild weather the rule all through the Middle West, prospects of any considerable amount of consumption in the remaining weeks of the winter are not bright.

The removal of the zoning restrictions, heretofore confining West Virginia and Kentucky coal marketed through this point to a field much more narrow than normal, will naturally have some effect upon the situation, enabling shippers to go into the markets in the West where their fuel formerly went as a matter of course.

This effect, however, will not be felt at once to any considerable extent, both for the reason that these shippers and operators will not immediately be able to resume connection with the channels through which their coal formerly moved, and that the same situation exists in the West as here, with reference to the supply of coal in the hands of consumers. In fact, shippers in this section have received direct appeals not to make shipments into the Western markets just now, as it is feared by the trade there that such a move would tend to demoralize the market utterly, by bringing about a large supply of unneeded spot coal. The situation will, therefore, work itself out only very slowly, and it is not by any means cheerful.

LOUISVILLE

Domestic demand slightly better, due to small stocking running low and slightly colder weather. Steam demand very weak. Domestic values up slightly due to lack of steam demand to take care of screenings. Mines operating three days.

There has been some slight improvement in domestic demand during the past few days, due to small stocks beginning to run low and slightly colder weather. However, at that the retailers are far from busy, some reporting that they are not working half of their equipment capacity. Some houses report that customers stocked so heavily that they have not used half of their coal as yet, and that business is dull. Collections are fair only.

The general demand for steam coal shows little improvement, and there is not much encouragement just now. Discussions of the prospects for early shipments to the lake region have brought out the fact that the North is still well stocked, and may not start buying before midsummer, unless severe weather develops within the next month or two. In the local field there is little demand, as industrial concerns are not busy, some being almost down. Practically all of them have good stocks on hand.

Mines are in operation about three days a week as a maximum, many putting in only two days. These mines for the most part are the large ones which have good sales organizations. The small mines in many instances are not attempting to turn a wheel, being unable to secure business.

Prices on steam coal are being shaded by many operators at the present time on immediate delivery stock, especially screenings. However, some of the large operators have already advanced prices 15c. to 25c. a ton on domestic coal, due to the fact that it is costing more money to get it out, and they have no market for the resulting screenings. However, prices are generally well maintained in the local market and field. Retailers are holding on firmly, feeling that price cutting would not really get them anything in the long run.

BIRMINGHAM

Inquiries for steam coal slacken, but domestic market remains strong. Better grades of steam coal moving fairly well, while the poorer grades are not being so readily absorbed. Shortage of domestic fuel still very pronounced.

There is not an active demand for steam coal in the Birmingham market at this time, though sufficient business is being booked to take up the output of the mines prodcing the better grades of fuel, taken in conjunction with the contracts on hand. There is some accumulation of cheaper grades of steam coal—Big Seam and the like—though the surplus is not yet sufficient to affect market conditions. Coals of the poorer quality are being moved with more difficulty than formerly. The present hesitancy in the market is not due to any decrease in requirements, but to a desire on the part of consumers to await the transition from Government control to the normal influences of supply and demand, and such price adjustments as will necessarily follow, based on quality instead of cost of production. The prices of some grades will probably be lowered slightly while others will be advanced.

The supply of domestic coal has been so pronounced since Apr. 1, 1918, that the removal of Government regulations will undoubtedly pave the way for an increase in prices of the higher grades. Although the present winter has been an exceptionally mild one so far, there is little coal stocked on local yards, retailers delivering the fuel to customers as fast as received.

Coke

CONNELLSVILLE

Further market decline. Settlements on contracts. Operators restricting production.

The furnace coke market has weakened farther and is now quotable at $5@5.50, the Government limit, which expired with January, having been $6. There has been little activity in the open market, but spot coke of fairly good quality has been readily available in the past few days at $5, and possibly in most cases with a margin to brokers besides. There has been little buying, furnaces being well covered by contracts, with a few exceptions, and depending on contracts to keep them supplied.

There have been active negotiations in connection with contracts calling for an agreed price from time to time whenever Government control should come off. These negotiations are regarded as establishing the real value of coke better than the odd lot sales that may occur in the open market. Service plays an important part in determining coke values, as it is expensive to the blast furnace to receive either too much or too little coke from day to day, and thus higher prices may be paid willingly on contracts, than the prices at which odd lots could be picked up. One prominent coke producer has proposed to contract holders that $5.50 be the settlement price for February deliveries, and it appears that most of this interest's contract holders have accepted the proposal. In other quarters, however, settlements have been made at not over $5.25, and in some instances $5 appears to have been done.

The coke operators express decided determination to regulate production to demand and avoid the dumping of any coke. The present experiment may be more successful than some past attempts. Operators recognized that there should be a decline from the Government limit and insist that the decline that has occurred does not presage a continually declining market.

The foundry coke market has not really been developed, demand being so light. Under no particular pressure makers of standard foundry coke have reduced their price 50c. from the Government limit, and there are indifferent brands availabie at less. The market is quotable at $5@5.50 for furnace coke and at $6.50 for standard grades of foundry coke, per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Jan. 25 at 277,324 tons, a decrease of 14,008 tons, and shipments of raw coal at 189,707 tons, a decrease of 5986 tons.

Buffalo—The demand is light. The furnaces do not get the cue yet as to what is expected of them, and they are not ready to buy in advance. With lighter running the local byproduct coke plants can about supply the needs here. With another plant running the demand ought to be taken care of in that way. It will be some time, though, before that is ready. Fuel coke will remain slack till there is a better movement in bituminous coal, which may not be right away. Vessel owners are getting no offers of rates on ore, but look for about the same rate and season in general as last year.

Middle Western

GENERAL REVIEW

Matter of prices now occupies chief interest. Region saturated with coal and practically little tonnage is moving. Franklin county operators talk of price increase.

The topic of the week is prices. On the one side there are the operators, who are face to face with their costs, know exactly what their properties can do, and are afraid to indulge in any price-cutting tactics. On the other side are the purchasing agents, with the big steam users, public utility plants, etc., who are confidently looking forward to a break in the market. They are doing everything they can do to bring about such a break. They claim they are taking their cue from the railroads, who, by the way, are the largest coal-consuming public the operator has to look to. What the result of this struggle will be no one can accurately foretell. Of course, there will be readjustments here and adjustments there, and in certain isolated cases prices will undoubtedly advance.

If common gossip is to be believed, the operators are not in a position to make any concession in regard to price, and at the same time operate their mines on a money-making basis, no matter how narrow the margin may be.

The weather has been miserable, so far as the coal man is concerned; in fact, the weather has been so mild that it is not necessary to go to Florida to enjoy the spring breezes. We are getting them right here in Chicago and the Middle West. This warm weather is a tremendous factor, as it affects both the domestic and steam consumer. If any actual figures are kept of the coal consumed this year, we venture to predict that these figures will be far below the average.

So far as actual market activities are concerned, there is practically no coal moving. The tonnage reports from the Geological Survey, for the first two weeks of the new year, were rather encouraging, as they showed a decidedly upward trend, but we do not believe that this upward movement will be maintained, as the country has reached a state where it is practically saturated with coal.

One of the purchasing agents for a railroad, having a huge mileage in this territory, was approached with the idea of selling him some coal. He listened attentively to what the operator had to say, and showed an intelligent interest in the problems that the operator was face to face with. He did not have much to say, however, and toward the end of the interview he remarked that if coal was offered to him for 10c. per ton, he would be unable to avail himself of the bargain, because his railroad has on hand as much coal as it can possibly use, both now and in the near future. This example shows pretty accurately the condition of the market.

There is considerable talk going around that the Franklin County operators, effective Feb. 1, will increase the prices from $2.55 per ton, f.o.b. mines, to $2.75 per ton, for the prepared sizes and that this 20c. per ton increase will be general on all the coal they produce. The Franklin County people have been well and favorably known for the excellence of their product, and if anyone is to obtain an increase over the Government price, after Feb. 1, these people are in a position to do that. This experiment is going to be watched with interest by the rest of the coal men.

When the news first came out, to the effect that the zone restrictions were to be lifted after Feb. 1, there was a lot of promiscuous buying of Eastern coal; but this buying has practically all stopped, as the users of Eastern coal realize that the coal season is practically done. It is safe to say that the majority of tonnage of Eastern coal moving into the Mid-West territory is shipped for domestic purposes only.

It has now been from eight to ten weeks since there was anything like an active market in the Mid-West territory, and it is believed that this inactivity will have resulted in the reduction of a great many storage piles, and that a substantial number of steam users will once more be in the market. It is hoped that this will be the case, because not much more is to be looked for this year from the retail trade.

CHICAGO

Retailers making every effort to dispose of their low-grade stocks to make room for Eastern fuels. Little signs of activity in steam trade. No concern about anthracite.

The retailers of Chicago are bending every effort toward cleaning up their yards of low-grade Illinois and Indiana coals, preparing to receive a new stock of the high-grade Eastern products, which they ordered to be shipped around Feb. 1. It is believed that whatever Eastern coal is to move in here has already been ordered, as the dealers have come to the conclusion that they have nothing more to expect from the winter months. This season has been the mildest experienced in many years, and it will not be an exaggeration to say that the average retailer will go into next year with a considerable supply of this year's coal on hand.

The Chicago steam trade is showing little signs of life. The best that can be reported is a car sold here and a car sold there, practically no sales being made of any substantial tonnage. The anthracite situation has ceased to be a factor in the market, as the public is geting all the anthracite at this time that they wish, and getting it without restrictions.

MILWAUKEE

Little doing in coal on account of mild weather. A drop in bituminous coal expected in February. Pocahontas reappears in the market.

"Nothing doing" is the laconic answer to all inquiries as to the state of the coal market. Mild weather has put a damper on both city and country trade, and deliveries are at such a low ebb that most of the trucks and teams formerly employed in the business are out of commission. Consumers of anthracite who were supplied with only two-thirds of their normal supply are refusing the remaining one-third, claiming they have sufficient fuel to last. Shipments to the interior are also nomiral in character.

Dealers predict a cut in prices of soft coal in February, following aggressive marketing on the part of Western producers, whose output has been greatly stimulated by the demands of the war period. There is no prospect of a letting down of anthracite prices, however. The nearest approach to a cut in this grade of coal was made by one dealer who receives his supplies by rail and who has waived the premium of 40c. per ton which has been allowed on rail coal.

A return of zero weather would help matters, but the spring will have to be unusually protracted and inclement to exhaust the piles of coal on the docks.

Pocohontas promises to become a factor in this market again. Dealers are receiving offers of the screened product at $3.25 at the mines.

ST. LOUIS

A demoralized market continues on everything. Summer weather prevailing and no steam or domestic demand.

The market situation in St. Louis is still demoralized, owing to the mild weather. There is practically no demand for domestic coal of any kind. Some Standard is moving into the poorer sections of the city, and the little anthracite that was ordered is being delivered, but a goodly portion of these orders have been cancelled, the consumer feeling that the weather conditions will not justify the putting in of any high priced coal at this time. The result is that the dealers are going to have a lot of anthracite egg unless cold weather comes in.

The country demand for domestic coal is similar to that of the city demand. Steam business is almost at a standstill. Many steam plants are working only half time, and some are not working at all. The storage piles are being used in many places, and even the railroads are not buying as they intimated they would. Instead they are resorting to their storage supplies. Never before at this season of the year has the market been in anywhere near as bad a condition as at the present time.

Car supply is good on practically all roads, but the movement on some roads is slowing up for no apparent reason. In the Standard district mines are idle for as long as ten days at a time. Screenings are piled up so that nothing else can be loaded, and seem to be the only size right now for which there is no market of any kind. The price got down to $1.20, and that does not move them. Two-inch Standard lump is still around $1.50 to $1.60, and 6-in. lump from $1.75 up. There is not much prospect for better times ahead in the Standard field.

In the Mt. Olive district prices, as a rule, are holding up to the Government maximum of $2.55. This field, however, is not working much better than the Standard field, although a fairly good tonnage is moving north. The tonnage coming into the St. Louis market seems to decrease on account of the difference in price between Mt. Olive and Standard.

In the Carterville field, Williamson and Franklin Counties, the past week showed a decided change for the worse. Many mines are idle because they have no orders, and others because they cannot move the screenings and nut. In a general way the Franklin County prices are being maintained, while in Williamson County there has been some cutting.

Effective Feb. 1, the Williamson and Franklin County organizations, under the leadership of F. C. Honnold, raised the price of domestic sizes to $2.75. These organizations, it is understood, will be merged as one, with Honnold as the directing head, J. L. Kieflein having resigned as secretary of the Williamson County organization.

A break in the price of these fields cannot be expected. These operators are convinced that they should get more money for their coal and they are going to demand it. The Government price on this coal has been $2.55, with special preparation of 10c. in some cases. There is much resentment among the retail trade and the steam users over this action on the part of the operators, but inasmuch as the operators are organized solidly in Franklin County, there is not much chance to make a change.

The conditions in these fields will improve rapidly with colder weather. Car supply is plentiful and movement fairly good.